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Eco-linguistics strategies for promoting rural literacy among farming households and farm families in Southeast, Nigeria

N. F. Nwulu^{*1}, F. U. Nnamani¹, C. R. Ayozie¹, C. F. Obumneke¹, B. N. Igbokwe¹,
C. I. Ahumaraeze¹, U. A. Agwuocha¹, M. A. C. Osuji¹, F. O. Egwim¹, K. U. Chukwu¹,
G. O. Mbarah¹, N. Emeka-Duru¹, C. F. Nlemchukwu¹, C. M. Okwara¹, J. U. Chikaire²

¹Directorate of General Studies Unit, Federal University of Technology, Owerri, Imo State, Nigeria

²Department of Agricultural Extension, Federal University of Technology, Owerri, Imo State, Nigeria

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ABSTRACT

This paper explores eco-linguistics strategies for promoting rural literacy among farming households and farm families in Southeast Nigeria. A total of 250 rural farmers were randomly selected for the study. Questionnaires on oral interviews were used to collect data for the study. Percentage, mean, and standard deviation were used to analyze the data. Results revealed that 36% of respondents were within the age range of 18–30 years, 56% were males, 70% were women, 22% had no formal education, and 22% had primary education. Farming (68%) is the major occupation. (50%) of respondents had a household size of 6–10 dependents, and 52% had spent 1–10 years of farming experience. On literacy levels, 26% cannot read or write, (59.6%) can read in local languages, (52%) also can write in local languages. The voice of indigenous languages is a promoting rural literacy include; enhancing of understanding learning materials (77.6%), facilitates faster learning and retention (74%), presence cultural knowledge and values (71.6%). The eco-linguistic strategies identified include the use of indigenous languages as the medium of instruction (92%), use of folk cores, song and oral traditions (96%), use of visual aids (92%), use of visual aids (95.2%), use of mother-tongue (78%), storytelling (83.6%), among others.

***Corresponding author:** N. F. Nwulu ✉ futoedung16@gmail.com

INTRODUCTION

Literacy continues to play a vital role in advancing socio-economic progress, particularly in rural areas where agriculture forms the backbone of livelihoods. In Southeast Nigeria, many farming communities face persistently low literacy levels, limiting their access to agricultural innovations, market data, and sustainable environmental practices. Eco-linguistics- a field that explores the interplay between language, culture, and the environment-provides a potential pathway for tackling rural illiteracy by connecting local knowledge systems with literacy initiatives (Fill and Penz, 2018). This approach prioritizes the use of native languages and culturally appropriate communication methods to improve comprehension and engagement. In agrarian communities, language is central to how ecological understanding, farming techniques, and traditional knowledge are passed down through generations. However, many literacy efforts have struggled because they rely on foreign or dominant languages like English, which many rural farmers do not fully grasp (Ouane and Glanz, 2010). In contrast, eco-linguistic models support the inclusion of local dialects, oral traditions, proverbs, storytelling, and environmental dialogue in teaching, making literacy more relatable and effective.

Moreover, eco-linguistics links literacy development with environmental stewardship. Since farmers' livelihoods depend on natural resources, their relationship with the environment is deeply influenced by language. Teaching literacy through this lens not only strengthens basic skills but also promotes awareness of sustainable farming and ecological conservation (Stibbe, 2015). This dual advantage is especially important in Southeast Nigeria, where issues like soil erosion, deforestation, and shifting climate patterns threaten agricultural output. By integrating eco-linguistic principles, literacy programs can better connect formal education with indigenous knowledge, improving learning outcomes and enabling rural farmers to make more informed decisions.

Even with various literacy efforts across Nigeria, rural farming populations in the southeast continue to show low literacy rates. Many programs are delivered in dominant languages such as English, which are often unfamiliar to local farmers, leading to poor participation and limited success (UNESCO, 2017). This mismatch between the language used and the learners' everyday linguistic experience weakens the impact of these initiatives. Furthermore, standard literacy programs frequently overlook the cultural and environmental realities of rural life. As a result, participants often fail to see how literacy applies to their farming routines or interactions with nature. This lack of relevance leads to disengagement, high dropout rates, and little improvement in either agricultural performance or environmental care. There is also minimal effort to include traditional ecological knowledge in literacy instruction. Farmers hold deep insights into weather cycles, soil health, and crop management; yet such knowledge is seldom recognized or integrated into formal education. Without applying eco-linguistic perspectives, literacy programs risk remaining abstract and disconnected from the lived experiences of rural communities.

Hence, there is a clear need to investigate eco-linguistic approaches that can advance literacy in rural areas while simultaneously supporting environmental awareness and agricultural effectiveness among farming populations in Southeast Nigeria. The main objective of this study is to examine eco-linguistic strategies for promoting rural literacy among farming populations in Southeast Nigeria. The specific objectives include to : a). identify existing literacy levels among rural farmers in Southeast Nigeria; b). examine the role of indigenous languages in promoting literacy' c). analyze eco-linguistic strategies applicable to rural literacy programs; d). assess the relationship between eco-linguistic literacy and sustainable farming practices; e). propose effective eco-linguistic models for improving rural literacy. This research holds importance as it tackles the ongoing challenge of illiteracy in rural areas through an

approach that is both culturally and environmentally grounded. By incorporating eco-linguistics into literacy efforts, it offers a practical model for improving educational outcomes among rural farming communities.

The study also informs policy by highlighting how local language and ecological knowledge can strengthen literacy programs. In addition, it aligns with broader sustainable development objectives, especially those focused on equitable education, alleviating poverty, and promoting environmental stewardship.

MATERIALS AND METHODS

The study was conducted in Southeast Nigeria, covering Abia, Anambra, Ebonyi, Enugu, and Imo States—regions predominantly inhabited by the Igbo people, whose livelihoods revolve around agriculture, trade, and other rural economic activities. Characterized by tropical rainforest and derived savannah ecosystems, the area supports major farming practices such as yam and cassava cultivation, rice production, palm oil extraction, and vegetable farming. This region was chosen due to ongoing literacy difficulties in rural areas, despite the presence of formal and informal education initiatives. Given that local languages remain the primary means of communication among farmers, eco-linguistic approaches are seen as particularly effective for promoting both literacy and environmental awareness. Moreover, increasing environmental degradation, poor agricultural information dissemination, and limited access to educational resources highlight the need for context-sensitive solutions like eco-linguistics.

A descriptive survey design was adopted to examine how eco-linguistic strategies can improve literacy within farming communities in this region. This method enabled the collection of perspectives, attitudes, and real-life experiences from farmers, educators, extension agents, and community leaders regarding the role of environmental communication in local languages. By combining qualitative and

quantitative techniques, the study aimed to provide a comprehensive view of how language rooted in local ecological knowledge can enhance literacy and environmental understanding in rural settings.

Data were gathered from both primary and secondary sources. Primary data came from questionnaires, interviews, and direct field observations. Secondary information was drawn from academic books, peer-reviewed journals, conference papers, government reports, and credible online publications related to eco-linguistics, rural education, sustainable farming, and literacy programs. The target population consisted of rural farming communities across the five states, including farmers, adult learners, agricultural extension officers, teachers, community leaders, and literacy program coordinators. The total population was estimated at 2,500 individuals from selected rural zones. A sample of 250 respondents was selected through a multistage process.

First, one rural local government area with notable farming activity and literacy challenges was deliberately chosen from each state. Then, two farming communities were randomly selected from each of these areas. Finally, participants were chosen using a mix of simple random and purposive sampling. Key informants such as extension workers, literacy instructors, and community leaders were selected purposively based on their experience in rural education, while farmers and adult learners were selected randomly to ensure balanced representation. Data collection involved several tools. Structured questionnaires were administered to farmers and adult learners to gather information on literacy levels, language use, environmental communication patterns, and existing eco-linguistic practices. Semi-structured oral interviews were held with community leaders, literacy facilitators, and agricultural officers to explore traditional communication methods and the obstacles affecting literacy development. Field observations were also conducted during community meetings, farming activities, and literacy classes to assess how local

languages are practically used in environmental education.

Additionally, a review of relevant literature provided theoretical and contextual grounding for the study.

Quantitative data from the questionnaires were analyzed using descriptive statistics such as frequencies, percentages, and mean scores with the help of the Statistical Package for the Social Sciences (SPSS) for efficient data processing. Qualitative data from interviews and observations were analyzed thematically, with responses grouped into core themes including local language use, environmental consciousness, literacy barriers, and eco-linguistic communication strategies. Results were presented using tables and narrative explanations to ensure clarity and ease of interpretation.

RESULTS AND DISCUSSION

Socioeconomic characteristics of respondents

Table 1 provides important insights into the literacy levels of livelihood patterns and exposure to eco-linguistic intervention. Majority (36%) of respondents were within the productive age range of 31–45 years, 32% were within 46–60 years. About 16% were within 18–30 years, and 61% and above respectively. The young population in farming is good sign of good things to come in the future as the population of farmers are aging, young once will take over. There are about 50% males and 44% females. The majority (70%) are married, 14% are single, while 6% and 10% are single and widowed. On education, 36% had primary education, 30% had secondary education, while 12% had adult education. Their major occupation is farming (68%), they have large family size of 6-10 persons. The respondents have spent 11-20 years in farming business as indicated by 1-10 which is (52%), 32% have spent 11-20 years where only 16% have spent more than 21 years. On income, 40% make below ₦50,000, while 52% have ₦60,000-100,000 monthly, 8% make more than that amount.

Table 1. Socioeconomic characteristics of respondents

Parameters	Frequency	Percentage
Age		
18-30	90	36.0
31-45	80	32.0
46-60	40	16.0
61-Above	40	16.0
Gender		
Male	140	56.0
Female	110	44.0
Marital status		
Single	35	14.0
Married	175	70.0
Divorced	25	10.0
Widowed	15	6.0
Educational attainment		
No formal education	55	22.0
Primary	90	36.0
Secondary	75	30.0
Adult education	30	12.0
Occupation		
Farming	170	68.0
Trading	35	14.0
Civil servant	20	8.0
Household size		
1-5	50	20.0
6-10	125	50.0
11-Above	75	30.0
Farming experience (Years)		
1-10	130	53.0
11-20	80	32.0
21-Above	40	16.0
Monthly income		
Below 50,000	100	40.0
60,000 -100,000	130	52.0
Above 100,000	20	8.0

Literacy levels among the respondents in the study zone

Table 2 indicates that 26% of the respondents are people who cannot read or write both in local languages or English language. A larger proportion however demonstrate partial or functional literacy skills. The highest competency is in the basic numeracy (counting, simple mathematics with 65.6%, meaning they can calculate in farming and trade. More farmers (59.6%) can read in local languages, especially Igbo language, 52% can also write in local languages. They are followed by, 38% who can also read in English and 32% that can write in English, while 34% can interpret agricultural information (such as labels, market prices). The above findings indicate that literacy programs should prioritize local language instructions especially Igbo and other dialects common in the zone.

Table 2. Literacy levels among rural farmers in southeast nigeria

Literacy skill/Level	Frequency (f)	Percentage (%)
Cannot read or write (illiterate)	65	26.0
Can read in local language (e.g., Igbo)	149	59.6
Can write in local language	130	52.0
Can read in English	95	38.0
Can write in English	80	32.0
Can perform basic numeracy (counting, simple math)	164	65.6
Can interpret agricultural information (e.g., labels, market prices)	85	34.0

Literacy rates among rural farmers in Southeast Nigeria continue to lag behind those in urban areas, though steady progress has been made through adult education initiatives, agricultural extension services, and expanded access to primary schooling. Literacy in this context is typically assessed by the ability to read and write, comprehend farming-related information, and use basic numeracy skills in agricultural production and marketing. Research shows that many rural farmers in the region have completed only primary education or less, with older farmers particularly likely to lack formal schooling. Data from the National Bureau of Statistics (2021) highlights that rural literacy across Nigeria is generally lower than urban literacy, largely due to poverty, weak educational infrastructure, and limited learning opportunities. However, Southeast Nigeria performs better than some other regions, reflecting its longstanding cultural emphasis on education and trade. Surveys in states like Enugu, Ebonyi, Anambra, Imo, and Abia reveal that while many farmers are fluent in local languages, they often face difficulties understanding English-language farming guides, maintaining written records, or using modern digital tools (Eze and Orebiyi, 2018). As a result, functional literacy remains at a moderate level. Farmers with secondary education are more inclined to adopt advanced farming methods, climate-resilient practices, and new agricultural technologies compared to those without formal education (Okeke *et al.*, 2020).

Government and non-governmental adult literacy efforts have helped improve rural literacy by teaching reading, writing, arithmetic, and practical farming knowledge. However, these programs face obstacles such as insufficient funding, inadequate learning

spaces, seasonal farming demands, and low participant motivation (UNESCO, 2020), all of which hinder broader engagement. There is also a gender gap in literacy, with men generally more literate than women, primarily because women in rural areas historically had fewer opportunities for formal education (Aroh, 2019). That said, recent educational outreach has significantly reduced this disparity. Despite growing mobile phone ownership, digital literacy among rural farmers remains limited. Many lack the skills to navigate smartphones, online agricultural platforms, or digital market systems, constrained by poor technological know-how and weak internet connectivity (Ogunniyi and Kehinde, 2021). This restricts their access to up-to-date farming advice and viable market channels.

A considerable number of rural farmers in Southeast Nigeria lack formal education and struggle with reading and writing in both English and local languages. As a result, they depend largely on spoken communication and traditional knowledge for agricultural practices. According to Fidelugwuowo (2020), approximately 29.8% of these farmers have never received formal schooling. Farmers at this level have acquired fundamental reading, writing, and numeracy skills, typically through primary education or adult literacy initiatives. They can manage simple tasks like reading basic instructions, identifying numbers, and grasping straightforward farming information. However, their abilities often fall short when it comes to understanding more technical agricultural content. Functional literacy involves using literacy skills in everyday farming tasks—such as maintaining records, following extension advice, measuring inputs, and selling produce. Farmers

with these skills are better equipped to adopt modern agricultural techniques and innovations. Research indicates that higher educational attainment strongly affects farmers' access to agricultural knowledge and their overall productivity. Digital literacy remains low among rural farmers in the region, primarily due to limited access to ICT infrastructure, electricity, and internet services. Despite this, some farmers rely on mobile phones, radio, and television to stay informed about agriculture. There is a gradual improvement in information access and awareness, particularly among younger farmers who are beginning to engage more with digital tools. Financial literacy is generally weak, especially concerning numerical skills, saving habits, loan management, and calculating interest. Benedict *et al.* (2024) noted significant gaps in farmers' understanding of compound interest and basic numeracy, although they showed a moderate grasp of concepts like inflation and risk spreading. Literacy related to health and safety is also limited. Many farmers cannot read labels or safety instructions on

agrochemicals, putting them at risk during the handling of pesticides and fertilizers. Apeh (2018) found that around 65% of farmers in Southeast Nigeria were unable to understand agrochemical application guidelines.

Role of indigenous languages in promoting literacy

Table 3 shows the important role of indigenous languages in promoting literacy among the farming population. These roles include; enhancement of understanding of learning materials (77.6%), facilitation of faster learning and retention (74%), promotes participation in literacy programs (62.0%), preserves cultural knowledge and values (71.6%), improves of communication in agricultural training (66.0%), encourages inclusion of non-literate adults (67.2%), support for interpretation of environmental/agricultural information (68.0%), builds confidence among learners (58.0%), bridges gap between formal education and local knowledge (63.2%), and enhancement of dissemination of extension services and innovations (74.8%).

Table 3. Role of indigenous languages in promoting literacy

Role of indigenous languages	Frequency	Percentage
Enhances understanding of learning materials	194	77.6
Facilitates faster learning and retention	185	74.0
Promotes participation in literacy programs	155	62.0
Preserves cultural knowledge and values	179	71.6
Improves communication in agricultural training	165	66.0
Encourages inclusion of non-literate adults	168	67.2
Supports interpretation of environmental and agricultural information	170	68.0
Builds confidence among learners	145	58.0
Bridges gap between formal education and local knowledge	158	63.2
Enhances dissemination of extension services and innovations	187	74.8

Indigenous languages therefore are critical tools for inclusive and effective literacy program.

Indigenous languages are vital in advancing literacy, particularly in rural and linguistically diverse settings like Nigeria. These languages-native to specific ethnic communities within a region-serve as key means of communication, cultural continuity, and learning. In Southeast Nigeria, languages such as Igbo play a central role in daily interaction and educational growth.

When used in literacy initiatives, they support better comprehension, active learner engagement, and improved retention of knowledge. A primary advantage of using indigenous languages in literacy education is enhanced learning. People typically grasp new concepts more readily when instruction occurs in their first language rather than a foreign one. UNESCO (2021) notes that teaching literacy in familiar languages allows learners to develop reading and writing skills more quickly, thanks to their existing grasp of vocabulary and grammar. This is

especially beneficial for rural farmers and adults with limited proficiency in English.

These languages also foster greater involvement in literacy efforts. Individuals in rural areas often feel more at ease and confident participating in learning activities conducted in their local tongue. Studies indicate that adult learners are more likely to attend and stay engaged in literacy classes when lessons are delivered in their native language rather than in English or other external languages (Bamgbose, 2017). This helps create inclusive learning environments and minimizes the anxiety sometimes linked to formal education. Moreover, indigenous languages help safeguard cultural heritage, traditional practices, and community-based knowledge. Literacy programmes in local languages contribute to maintaining oral histories, indigenous farming techniques, ecological wisdom, and shared values across generations (Ngugi wa Thiong'o, 2018). In Southeast Nigeria, the Igbo language, for example, carries forward proverbs, folktales, and agricultural know-how within communities.

They also support functional and agricultural literacy. When information on farming methods, health, and environmental management is shared in native languages, rural populations are better able to understand and apply it. This leads to wider adoption of improved farming practices and sustainable resource use (Emejulu and Chukwu, 2020). Farmers who access literacy content in their mother tongue are more likely to integrate that knowledge into their everyday work.

Another key benefit is the positive impact on cognitive development and academic success.

Children who start school in their first language often build stronger foundational literacy skills before moving on to second-language instruction. Research by Cummins (2000) suggests that mother-tongue education supports intellectual growth and leads to better long-term academic outcomes. Thus, early

instruction in indigenous languages lays a stronger base for future learning.

Despite these advantages, the use of indigenous languages in literacy faces obstacles. Many African native languages lack adequate teaching materials, qualified instructors, and institutional backing. The widespread use of English in official and academic contexts further marginalizes local languages in education (Adegbiya, 2004). Additionally, some parents view indigenous languages as less useful for career advancement, which can weaken support for mother-tongue-based schooling. In summary, indigenous languages are crucial for advancing literacy, preserving culture, encouraging educational access, and supporting socio-economic progress.

Integrating them effectively into literacy programmes can significantly boost learning outcomes, especially among rural communities in Southeast Nigeria and similar multilingual regions.

Governments and education authorities should therefore reinforce policies that promote and sustain indigenous language use in education.

Eco-linguistic strategies for promoting rural literacy

Table 4 shows that the most widely supported strategy is the use of local songs, folktales, and oral traditions. Use of visual and context-based instructional materials (95.2%), use of indigenous language as medium of instruction (95.2%). Integration of local environmental and agricultural vocabulary (84%) into literacy programs incorporation of local problems and storytelling (70%), integration of indigenous ecological knowledge into the curriculum (68.0%) are accepted strategies. These emphasize the central role of indigenous language into literacy development program. Other strategies include community-based learning (64.0%), translation of literacy materials into indigenous languages (66.0%), participatory teaching methods (63.2%), training of facilitators in eco-linguistic approaches (60.0%) among others.

Table 4. Eco-linguistic strategies for promoting rural literacy

Eco-linguistic strategy	*Frequency	Percentage
Use of indigenous language as medium of instruction	230	92.0
Incorporation of local proverbs and storytelling	175	70.0
Integration of environmental and agricultural vocabulary	210	84
Community-based learning (peer and group learning in local language)	160	64.0
Use of local songs, folktales, and oral traditions	241	96.0
Translation of literacy materials into indigenous languages	165	66.0
Participatory teaching methods (dialogue, discussion in local dialects)	158	63.2
Training of facilitators in eco-linguistic approaches	150	60.0
Use of visual and context-based instructional materials	238	95.2
Integration of indigenous ecological knowledge into curriculum	170	68.0

*Multiple responses

Eco-linguistic strategies are language-focused methods designed to support sustainable relationships among people, culture, and the environment, while also advancing communication and literacy. Rooted in eco-linguistics, these strategies highlight how language and society interact with ecological sustainability. They are especially valuable in rural literacy initiatives, where local knowledge, environmental understanding, and native languages can be woven into teaching practices. This integration is particularly effective in rural areas of Southeast Nigeria, where agriculture, cultural traditions, and community communication systems are deeply interwoven. A key approach involves using indigenous languages as the primary medium of instruction. Delivering literacy education in local languages like Igbo improves comprehension and engagement, as it aligns with learners' lived cultural and environmental contexts. Fill and Penz (2018) argue that eco-linguistics supports the maintenance of native languages, which often carry vital ecological insights and cultural values necessary for sustainable living. When literacy instruction reflects familiar surroundings and is delivered in a learner's first language, it becomes more accessible and meaningful.

Another effective method is embedding environmental education into literacy content. Topics such as climate change, soil preservation, deforestation, water use, and sustainable farming can be included in reading and writing activities. This dual focus strengthens both literacy and environmental awareness. As Stibbe (2021) notes, eco-linguistics aims to shift language use in ways that

foster environmentally responsible attitudes and actions. Therefore, learning materials should nurture ecological responsibility while building communication skills. Storytelling and oral traditions also play a significant role. Folktales, proverbs, songs, and spoken narratives from indigenous cultures frequently convey messages about environmental stewardship, community cooperation, and resource management. Integrating these forms into literacy teaching helps sustain cultural identity and makes learning more relatable and engaging (Mühlhäusler, 2003). In Southeast Nigeria, traditional Igbo stories related to farming, forests, and rivers can be adapted into reading materials for both youth and adults.

Community-based, participatory learning is another impactful strategy. It brings together farmers, elders, local leaders, and knowledge keepers in designing and delivering literacy programmes. This involvement ensures that content reflects real-life environmental conditions and community priorities. Ecolinguistics research suggests that language learning gains deeper significance when connected to daily social and ecological experiences (Alexander and Stibbe, 2014). This model also promotes inclusion and collective decision-making in rural settings.

Equally important is the development of practical, context-specific literacy materials.

Educational resources should address everyday rural concerns such as farming, health, sanitation, and market interactions. Literacy and numeracy skills can be taught through tools like farm logs, planting

schedules, weather reports, and environmental guidelines in local languages. This functional approach enhances the usefulness of literacy programmes and supports ongoing learner involvement (Rogers, 2013).

Digital eco-linguistic tools are gaining importance in contemporary rural education. Audio and video content, community radio, mobile apps, and digital platforms in local languages can effectively deliver literacy and environmental knowledge. While access to technology remains limited in some areas, when tailored to local needs, these tools can aid both language preservation and learning (Crystal, 2010). For example, radio broadcasts in indigenous languages can inform farmers about sustainable practices while improving listening and communication abilities. Despite their potential, several obstacles limit the widespread use of these strategies.

Challenges include insufficient funding, a lack of trained instructors, scarce learning materials in native languages, and the institutional preference for English in formal education. Additionally, weak infrastructure and limited digital access in rural regions hinder the adoption of innovative approaches (Bamgbose, 2017).

Finally, eco-linguistic strategies offer culturally grounded and sustainable pathways for enhancing rural literacy. By incorporating local languages, environmental themes, oral traditions, community participation, practical content, and digital tools, these approaches can significantly improve literacy outcomes. Embedding eco-linguistic principles into rural education not only strengthens literacy but also fosters environmental consciousness, cultural continuity, and long-term community resilience in Southeast Nigeria.

Perceived influence of eco-linguistic literacy on sustainable farming practices

Table 5 shows the perceived the influence of eco-linguistic literacy on sustainable farming practices. These influences include enhances understanding of sustainable farming techniques (M= 3.16), improves soil conservation practices (M= 3.08), promotes use of organic farming methods (M = 3.05), increased awareness of climate change impacts (M= 3.14), improves pest and disease management (M= 3.03), enhances water conservation practices (M= 3.07), encouragement of adoption of modern agricultural innovations (M = 3.04), strengthening of knowledge of indigenous farming practices (M= 3.22), improves farm productivity and yield (M= 3.12), and enhances environmental protection and sustainability awareness (M= 3.18).

Table 5. Perceived influence of eco-linguistic literacy on sustainable farming practices

#	Statement	SA	A	D	SD	Total	Mean
1	Enhances understanding of sustainable farming techniques	110	90	30	20	250	3.16
2	Improves soil conservation practices	105	85	35	25	250	3.08
3	Promotes use of organic farming methods	100	88	37	25	250	3.05
4	Increases awareness of climate change impacts	115	80	30	25	250	3.14
5	Improves pest and disease management	95	92	38	25	250	3.03
6	Enhances water conservation practices	102	86	40	22	250	3.07
7	Encourages adoption of modern agricultural innovations	98	90	37	25	250	3.04
8	Strengthens knowledge of indigenous farming practices	120	85	25	20	250	3.22
9	Improves farm productivity and yield	108	88	30	24	250	3.12
10	Enhances environmental protection and sustainability awareness	112	90	28	20	250	3.18

A key perceived impact of eco-linguistic literacy on sustainable farming is its role in increasing farmers' environmental awareness. When literacy initiatives use local languages and integrate ecological concepts, farmers gain a clearer understanding of challenges like soil degradation, climate change, erosion,

deforestation, and water conservation. As Stibbe (2021) notes, the way language is used in environmental communication shapes how people view and engage with their surroundings. Farmers taught in languages tied to their cultural context are more likely to embrace eco-friendly practices, as the

information feels more accessible and relevant to their daily lives. Eco-linguistic literacy also supports the uptake of sustainable agricultural methods.

Literacy instruction in native languages can convey practical knowledge about crop rotation, organic fertilizers, agroforestry, intercropping, and responsible land use. Research indicates that literacy enhances farmers' ability to grasp extension advice and apply new agricultural technologies effectively (Aker, 2011). In Southeast Nigeria, for instance, farmers who receive environmental education in Igbo are often more inclined to adopt farming techniques focused on conservation.

Another important effect is the safeguarding and sharing of traditional ecological knowledge.

Indigenous languages carry deep insights into local ecosystems, weather cycles, medicinal plants, soil health, and time-tested farming approaches. By incorporating this knowledge into literacy curricula, eco-linguistic programmes help preserve it for future generations. Maffi and Woodley (2010) emphasize that indigenous languages play a vital role in biodiversity conservation, as they contain generations of accumulated environmental wisdom. Literacy efforts that include local sayings, stories, and proverbs help sustain cultural practices that support environmental balance. Moreover, eco-linguistic literacy improves dialogue between agricultural advisors and rural farmers. Many extension services struggle because technical content is delivered in foreign languages or complex scientific terms. Using local languages and culturally appropriate messaging enhances comprehension and encourages greater farmer involvement in development projects (Emejulu and Chukwu, 2020). Clear communication empowers farmers to make better choices about pest management, irrigation, waste handling, and adapting to climate shifts.

It also fosters community involvement in environmental protection. Literacy programmes that highlight shared responsibility for the environment

often motivate rural groups to take part in tree planting, erosion control, cleanliness campaigns, and efforts to protect biodiversity. Such education reinforces values of collaboration and living in harmony with nature—principles deeply embedded in many African traditional worldviews (Fill and Penz, 2018). In addition, eco-linguistic literacy can enhance food security and improve rural livelihoods. Farmers who understand sustainable agriculture are more likely to maintain high yields while conserving natural resources. Literacy opens access to vital farming information, market networks, and climate-resilient techniques, boosting both productivity and economic resilience (FAO, 2019).

Thus, sustainable farming supported by eco-linguistic education contributes to lasting rural progress. Despite these advantages, several obstacles limit the success of such initiatives. These include insufficient funding for rural literacy, a shortage of learning materials in local languages, limited access to digital tools, and weak institutional backing for mother-tongue education. The widespread use of English in formal agricultural settings further sidelines indigenous languages in outreach efforts (Bamgbose, 2017).

Proposed eco-linguistic models for improving rural literacy

Table 6 shows that the most preferred model is the storytelling and oral tradition-based model (83.6%), mother-tongue based literacy model (78.0%), multilingual literacy model (73.6%), indigenous knowledge integration model (72.0%), ICT-supported indigenous language learning model (72.0%), extension service-linked literacy model (72.0%), community participatory learning model (68.0%), functional literacy model (64%) agro-ecological literacy model (68.4%). One effective approach in eco-linguistics is the Mother-Tongue-Based Literacy Model, which promotes the use of native languages like Igbo as the main medium in literacy instruction.

Teaching in a learner's first language reduces communication obstacles and enhances

understanding. UNESCO (2021) reports that using the mother tongue in education leads to better reading skills, higher engagement, and improved retention. For rural farmers, learning in their native language makes it easier to apply new knowledge to agriculture, health, and environmental practices.

Another valuable approach is the Functional Literacy Model, which connects literacy training to real-life situations and occupational demands. In

rural settings, lessons are tied to farming, environmental protection, health awareness, and local economic activities. As Rogers (2013) points out, this relevance boosts motivation because learners immediately see how the skills apply to their daily lives. For example, farmers can develop reading, writing, and math abilities through tasks like tracking crop yields, interpreting weather patterns, calculating market prices, and managing land sustainably.

Table 6. Proposed eco-linguistic models for improving rural literacy

Eco-linguistic model	*Frequency (f)	Percentage (%)
Mother-tongue based literacy model	195	78.0
Community participatory learning model	170	68.0
Indigenous knowledge integration model	180	72.0
Storytelling and oral tradition-based model	209	83.6
Agro-ecological literacy model (linking literacy with farming practices)	171	68.4
Functional literacy model (context-based reading and writing)	160	64.0
Multilingual literacy model (local language + English)	184	73.6
Environmental education integration model	172	68.8
ICT-supported indigenous language learning model	180	72
Extension service-linked literacy model	180	72

*Multiple responses

The Participatory Eco-Linguistic Model also proves effective in rural contexts. It involves community members, traditional leaders, farmers, and local educators in shaping and delivering literacy initiatives. Rooted in Paulo Freire's theory of participatory education (1970), this model prioritizes dialogue, collaborative problem-solving, and active learning over rote instruction. Through this method, rural learners engage in discussions about local environmental issues and build literacy skills while working together on practical ecological solutions.

The Indigenous Knowledge Integration Model incorporates traditional ecological wisdom, oral histories, proverbs, folktales, and cultural expressions into literacy programmes. Local languages often carry deep knowledge about farming techniques, biodiversity, and natural resource stewardship. Maffi and Woodley (2010) highlight that such knowledge systems support sustainable development by preserving generations of environmental insight. Including them in literacy education strengthens cultural identity and fosters ecological responsibility.

The Community Media and Communication Model leverages local channels—such as community radio, storytelling, drama, folk music, and mobile platforms—to deliver literacy and environmental content. Radio broadcasts in indigenous languages, for instance, provide accessible information on farming, climate change, and basic education, especially where formal schooling is limited (Aker, 2011). This strategy is particularly effective in remote regions with minimal educational infrastructure.

The Environmental Education Literacy Model integrates ecological topics into literacy teaching by using reading and writing exercises focused on climate change, soil erosion, waste disposal, deforestation, and sustainable farming. Stibbe (2021) emphasizes that eco-linguistics aims to shift communication toward greater environmental sustainability. Programmes combining literacy with environmental themes help learners become both more proficient in language and more aware of their ecological responsibilities.

Finally, the Digital Eco-Linguistic Model is gaining importance in contemporary literacy efforts. It employs digital tools like mobile apps, audiovisual materials, and online platforms in indigenous languages to support literacy and environmental learning. While access to technology remains a challenge in many rural areas, adapting digital innovations to local needs can expand educational opportunities and improve access to vital agricultural and environmental information (Crystal, 2010).

CONCLUSION

Eco-linguistic approaches are instrumental in advancing rural literacy among farming communities in Southeast Nigeria. By incorporating native languages, traditional storytelling, folk songs, proverbs, and expressions tied to the local environment, these methods foster greater comprehension and engagement in literacy efforts. They also help overcome communication barriers between educators, agricultural extension agents, and farmers, while safeguarding indigenous knowledge and ecological values. The research found that embedding eco-linguistic practices into rural education and agricultural outreach can enhance literacy levels, promote environmental consciousness, and support sustainable farming. As a result, government bodies, schools, NGOs, and community leaders are encouraged to adopt locally rooted communication strategies and vernacular languages in literacy drives and environmental education programs.

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