REPOSITIONING ENVIRONMENTAL EDUCATION FOR ENHANCIING AGROECOLOGICAL PRACTICES AND FOOD SECURITY IN RURAL NIGERIA: CHALLENGES AND PROSPECTS

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Abstract

This paper examines how environmental education strengthens agroecological practices and food security in rural Nigeria. The country continues to face serious food-security challenges; the World Bank reported that more than 31 million people experienced acute food insecurity in 2024, amid rising prices, conflict and climate-related pressures. Rural communities are particularly vulnerable when unsustainable farming practices degrade soil and natural resources and threaten biodiversity. Environmental education can support agroecology by helping farmers understand and apply practices that sustain production while protecting the environment. Agriculture is also central to rural livelihoods: the Food and Agriculture Organisation estimates that it employed about 40% of Nigeria's labour force between 2021 and 2024. The paper discusses the prospects and challenges of repositioning environmental education to support agroecological practices and food security. It concludes that progress requires a coordinated approach, including policy reform and support for environmental education and sustainable agriculture.

Keywords: *Environmental Education, Agroecological Practices, Food Security, Rural Nigeria and Behavioural Change.*

Introduction

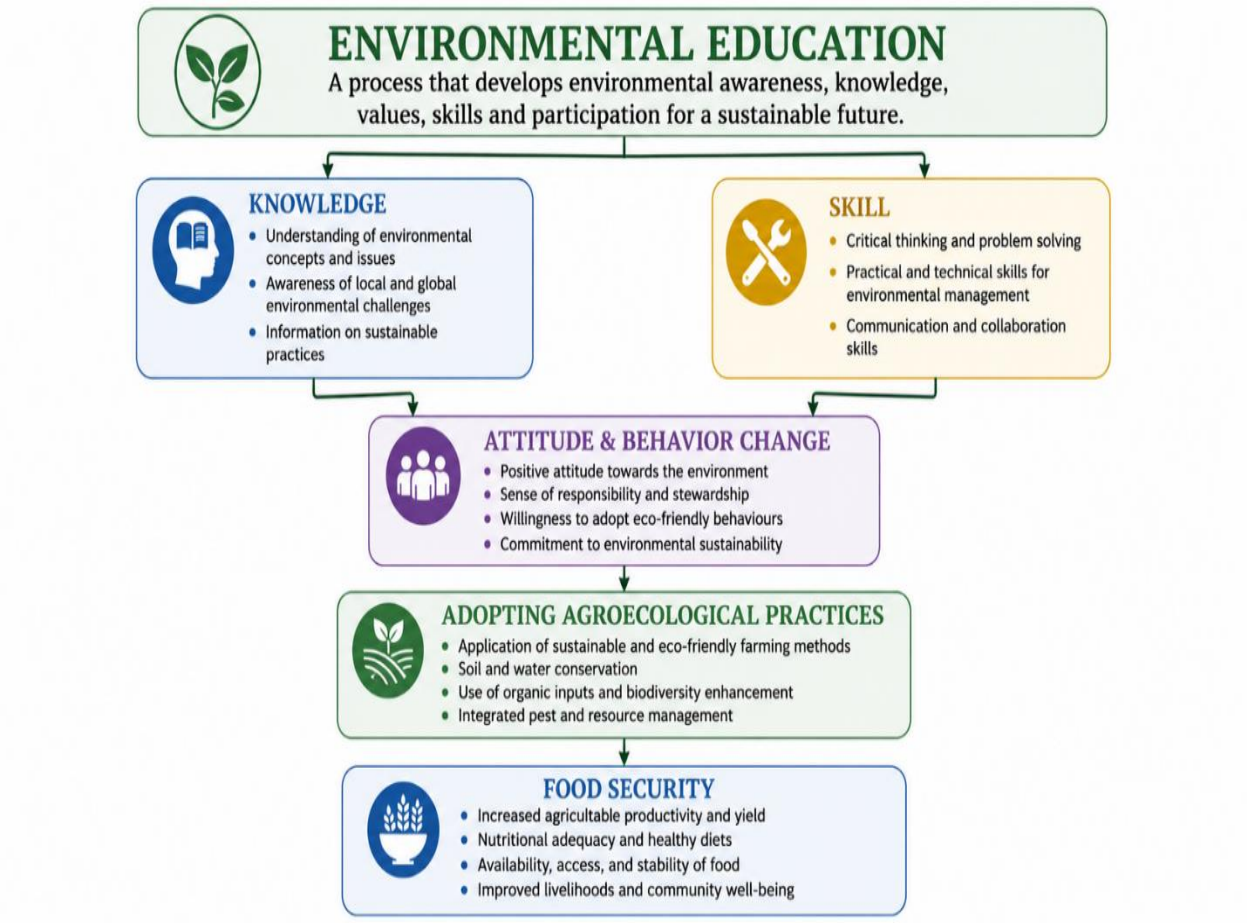
Food security is a persistent concern in rural Nigeria, where many households depend on agriculture for their livelihoods. It involves more than the quantity of food produced; it also includes people's ability to access and use adequate food consistently. Inadequate farming practices and environmental degradation can threaten rural livelihoods and undermine food security. Addressing these challenges requires approaches that support agricultural production while conserving natural resources.

Agroecological practices-including crop rotation, intercropping and integrated pest management-can help farmers manage soil, pests and biodiversity while adapting to climate pressures. Environmental education can support adoption by building farmers' knowledge of agroecosystems and encouraging the integration of local ecological knowledge with scientific research. Its role may therefore extend beyond information-sharing to fostering sustainable attitudes and practices. However, adoption may be constrained by limited educational resources, insufficient training for extension workers and sociocultural barriers (Emeana, 2021).

Akunne (2025) examines the contribution of agroecological practices to food security, while Akpan (2025) considers how environmental education may address food-security challenges. Further analysis is needed to understand how environmental education can support the adoption of agroecological practices and how these practices relate to food-security outcomes in rural Nigerian contexts. This paper examines that connection, including the prospects and challenges of repositioning environmental education to support agroecology and food security.

Conceptual Framework

This framework proposes the following pathway:



Source: Omage & Adiatu (2026).

The proposed framework positions environmental education as a foundation for adopting agroecological practices and supporting food security. Environmental education can develop ecological knowledge, practical skills and opportunities to reflect on existing farming practices. These learning experiences may shape attitudes and readiness to change. Whether this readiness leads to adoption depends on enabling conditions, including agricultural extension, peer learning, market access and institutional support. Adoption may, in turn, contribute to food-security outcomes through improved resilience, more efficient resource use, dietary diversity, income stability and reduced vulnerability to environmental shocks. The framework is not deterministic: environmental education alone does not guarantee adoption or food security; its effects depend on how learning interacts with local conditions.

Environmental Education

Environmental education is a lifelong process through which people and communities develop knowledge, skills, values and attitudes that help them make informed decisions and take responsible action concerning the environment. It therefore extends beyond raising awareness to include practical competence, participation and action. Ardoin et al. (2020) found that environmental education programmes reporting direct conservation outcomes often addressed locally relevant issues, involved partnerships and included action-oriented activities.

In rural Nigeria, environmental education may help farmers understand agroecological approaches and their relationship to biodiversity, soil health and water management. It can also support integrating local ecological knowledge with scientific research. These approaches may help farmers respond to environmental pressures, although outcomes depend on the availability of training, resources and other forms of support (Okorie & Ijeoma, 2026). Environmental education is therefore best considered as one element of a broader effort to support sustainable agriculture and rural food security.

Agroecological Practices

Agroecology applies ecological principles to design and manage agricultural systems (Richard, 2024). Agroecological practices include crop diversification, soil-health management, responsible use of organic inputs and the application of traditional ecological knowledge. They seek to support food production while conserving natural resources and biodiversity.

In rural Nigeria, these practices may help address soil erosion, deforestation and biodiversity loss while supporting the long-term productivity of farming systems. However, adoption may be constrained by limited access to training and information, as well as agricultural policies that favour industrialised production over locally adapted approaches.

Food self-provisioning is also relevant to this framework. Onyenekwe et al. (2024) discuss how household food production may align with agroecological principles, including biodiversity, soil health and locally grounded farming knowledge. Producing food for household use may contribute to dietary variety and reduce dependence on external markets. However, the extent of these benefits can vary with household resources, environmental conditions and access to markets.

Environmental Education, Agroecological Practices and Food Security: The Nexus

The relationship among environmental education (EE), agroecological practices and food security can be understood as a pathway from learning to action. Environmental education can strengthen farmers' knowledge and practical skills, shape their understanding of ecological issues, and support the adoption of agroecological practices when suitable resources and enabling conditions are available. Sustained use of these practices may contribute to more resilient production, natural-resource conservation and improved food security. However, this pathway is not automatic: farmers make decisions within economic and institutional contexts, so educational initiatives are more likely to be effective when supported by agricultural extension services, market access, peer learning and enabling policies.

Integrating local and Indigenous knowledge with scientific knowledge can make environmental education more relevant to farmers' circumstances. Programmes that recognise existing knowledge and practices may encourage participation and help farmers assess approaches such as crop diversification, intercropping and organic soil management. The suitability and benefits of these practices depend on local conditions, including farmers' resources, climate and access to markets.

The effectiveness of environmental education can be assessed through changes in knowledge and farming practices, as well as through broader outcomes such as yields, livelihoods and food security. For example, education about organic fertilisers and integrated pest management may help farmers make informed decisions about their use; the effects on production and household food security should be established through evidence from the relevant context (Ike et al., 2025). At the community level, educational programmes may also support knowledge-sharing and cooperative activity. In Nigeria, however, limited infrastructure and learning resources, inconsistent government support, and restricted access to information technology and extension services can constrain programme delivery. Socioeconomic pressures and concerns about unfamiliar practices may also affect farmers' participation and adoption.

Challenges in Repositioning Environmental Education for Agroecological Practices

Environmental education in rural Nigeria faces socioeconomic, infrastructural and cultural challenges that may limit the dissemination and adoption of agroecological practices. Poverty can restrict access to educational resources and participation in environmental programmes (Ejiogu & Ohazurike, 2024). Where households must prioritise immediate income and food needs, longer-

term environmental concerns may receive less attention. Limited funding among households and local governments can also affect the continuity and reach of EE programmes.

Infrastructural constraints create further difficulties. Some rural schools and community learning centres lack teaching materials, trained educators and reliable access to technology (Ejiogu & Ohazurike, 2024). Inadequate water and sanitation facilities can affect the learning environment, while poor transport links may prevent farmers from attending workshops or accessing extension services. These conditions can limit opportunities to learn about and practise agroecological methods.

Cultural beliefs and established farming practices also shape how farmers receive new information. These practices should not be treated as inherently incompatible with agroecology: some may support sustainable resource use, while others may need adaptation in response to changing environmental and economic conditions. Farmers may be cautious about unfamiliar techniques, particularly when their benefits are uncertain, or the costs and risks of adoption fall on them. Environmental education should therefore engage farmers in assessing proposed practices and adapting them to local needs rather than presenting them as a replacement for local knowledge (Ejiogu & Ohazurike, 2024).

Access to relevant information remains another challenge. Although many farmers hold valuable traditional knowledge, this knowledge may not be formally recognised or incorporated into educational programmes. EE initiatives should combine locally relevant experience with practical learning about methods such as crop rotation, intercropping and organic pest management. Their applicability should be considered in light of farmers' resources and production goals, including household food provision. Limited access to markets, transport and storage can also make it difficult to distribute surplus produce, while inadequate water infrastructure can constrain production (Onyenekwe et al., 2024). These challenges suggest that repositioning EE requires both locally responsive learning programmes and broader support for the conditions shaping farmers' decisions.

Prospects for Repositioning Environmental Education to Enhance Agroecological Practices and Food Security in Rural Nigeria

Repositioning environmental education (EE) in rural Nigeria offers opportunities to strengthen agroecological practices and support food security. Rather than focusing mainly on classroom knowledge about environmental problems, EE can be designed as a practical, participatory process that helps farmers manage land, water, biodiversity and other agricultural resources sustainably. This aligns with the Food and Agriculture Organisation's description of agroecology as an integrated approach that combines ecological and social principles, adapts to local contexts, and draws on both scientific and local knowledge (FAO, "What is Agroecology?").

One opportunity is to integrate agroecology into farmer education and extension programmes. EE can provide practical learning about crop diversification, intercropping, agroforestry, soil management, biological pest control, water conservation, composting and integrated crop–livestock systems. The manuscript cites FAO (2024) as reporting positive food-security and nutrition outcomes in 78% of assessed cases. If retained, check this statistic against the original FAO source and its stated scope. More generally, agroecological practices may support production, resilience and household nutrition, but their outcomes depend on local conditions and implementation.

Farmer Field Schools and other participatory approaches offer another prospect. They enable farmers to observe agroecosystems, test practices and discuss which approaches suit their circumstances. These programmes can also connect farmers' knowledge with research and extension expertise. This emphasis on locally adapted, co-created knowledge is consistent with FAO's framework for agroecology (FAO, "Co-creation and Sharing of Knowledge").

Digital and climate-informed education may extend these opportunities to geographically dispersed communities. Mobile phones, rural radio, digital platforms and localised weather advisories can complement in-person extension. The World Bank's 2026 Nigeria AGROW project includes digital advisory services, localised weather and climate information, stronger extension services and a national digital farmer registry, which could provide a platform for expanding agricultural learning (World Bank, Nigeria AGROW project).

Repositioned EE can also support women's and young people's participation, community innovation, and the implementation of agricultural policies. Integrating it into schools, extension services, farmer organisations and community programmes could help develop environmental knowledge and practical skills among farmers and rural entrepreneurs. Sustained investment,

research–farmer partnerships and supportive policies will be needed to connect education with the resources and services required for agroecological practices to contribute to resilient and food-secure rural communities.

Conclusion

Addressing food insecurity and promoting sustainable agriculture in rural Nigeria require coordinated action. Environmental education can support agroecological learning when it is locally relevant, participatory and connected to extension services, infrastructure, markets and supportive policies. A system-wide approach involving government, educational institutions, farming communities and agricultural organisations can help create the conditions for more resilient food systems while conserving natural resources.

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