(KEJAANS)

KEBBI JOURNAL OF AGRICULTURE AND NATURAL SCIENCES

September, 2025, Vol. 1, issue 2

KEJAANS

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ISSN: 1595-5776

KEBBI JOURNAL OF AGRICULTURE AND NATURAL SCIENCES (KEJAANS)

September, 2025; Volume 1, Issue 2

OFFICIAL JOURNAL OF THE

FACULTY OF AGRICULTURE

ABDULLAHI FODIO UNIVERSITY OF SCIENCE AND TECHNOLOGY, ALIERO

ISSN: 1595-5776

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KEBBI JOURNAL OF AGRICULTURE AND NATURAL SCIENCES (KEJAANS)
September, 2025: Volume 1, Issue 2 : 210-221
p-ISSN: 1595-5776

ETHNO- AGRICULTURE AND ITS SIGNIFICANCE ON AGRICULTURAL DEVELOPMENT: A REVIEW

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ABSTRACT

Ethno-agriculture, the practice of integrating traditional knowledge and cultural practices into agricultural systems, plays a crucial role in the development of sustainable and resilient agricultural practices in Nigeria. This review explores the significance of ethno-agriculture in enhancing food security, promoting sustainable farming practices, and preserving biodiversity within the country. Ethno-agricultural practices encompass a wide range of techniques, such as polyculture, crop rotation, and the use of native species, which have been refined over generations to adapt to specific environmental conditions. These practices not only enhance agricultural productivity but also contribute to the preservation of ecosystems and the maintenance of genetic diversity. Traditional farming methods, which have been refined over generations, are closely aligned with local environmental conditions and offer valuable insights for addressing contemporary agricultural challenges, such as climate change and soil degradation. The review also examines the potential of ethno-agriculture to contribute to economic growth by supporting smallholder farmers and promoting the use of indigenous crops with high market value. Despite its benefits, ethno-agriculture faces challenges, including the erosion of traditional knowledge and limited integration into formal agricultural policies. This paper highlights the need for a more inclusive approach that recognizes the value of ethno-agriculture in Nigeria's agricultural development, suggesting that a blend of indigenous practices and modern agricultural techniques could lead to more resilient and sustainable food systems.

Keywords**:** Ethno- agriculture, significance, agricultural development and Nigeria

Introduction

Ethno-agriculture, a term that encompasses the traditional agricultural practices and indigenous knowledge systems developed by local communities over centuries, plays a crucial role in shaping agricultural development, particularly in regions like Nigeria. This form of agriculture is deeply rooted in the cultural heritage and environmental contexts of indigenous peoples, offering a sustainable and resilient approach to farming that modern agricultural practices often overlook. The importance of ethno-agriculture in Nigeria cannot be overstated, as it provides not only a means of sustenance but also a pathway to preserving biodiversity, enhancing food security, and promoting ecological balance. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES.2019).

Nigeria's agricultural landscape is diverse, characterized by a variety of ecosystems ranging from arid savannas to lush rainforests. Within these environments, indigenous farming communities have developed practices that are intricately linked to their

natural surroundings. These practices include crop rotation, intercropping, the use of organic fertilizers, and traditional pest management techniques, all of which are designed to maintain soil fertility, minimize environmental impact, and ensure the long-term sustainability of agricultural systems (Altieri, 2004, FAO, 2021, Olatunji, 2019). The reliance on indigenous crops such as yam, cassava, sweet potato, millet, and sorghum, which are well adapted to local conditions, further underscores the relevance of ethno-agriculture in Nigeria (Adebayo & Akintola, 2020, FAO, 2022). Despite its significance, ethno-agriculture faces numerous challenges in Nigeria. The increasing commercialization and industrialization of agriculture, driven by the need to meet the demands of a growing population and global markets, have led to the marginalization of traditional farming practices. This shift often results in the loss of valuable indigenous knowledge and a decline in the use of native crops, which are replaced by high-yield, commercial varieties (Altieri & Koohafkan, 2008, Oni, 2018).

Moreover, national agricultural policies tend to prioritize modern agricultural techniques, often overlooking the potential benefits of integrating traditional practices with contemporary innovations (Aistara, 2021, Nwankwo, 2021). However, the growing recognition of the limitations of modern agriculture, particularly in the context of climate change and environmental degradation, has renewed interest in the potential of ethno-agriculture. Researchers and policymakers are increasingly advocating for a more holistic approach to agricultural development that incorporates indigenous knowledge systems. Such an approach can enhance resilience to climate variability, protect biodiversity, and support the livelihoods of smallholder farmers, who constitute the majority of Nigeria's agricultural workforce (Agboola, 2019, Okeke, 2022). Furthermore, the economic potential of indigenous crops, which are not only culturally significant but also nutritionally rich and suited to local conditions, presents an opportunity for value addition and market expansion (Adeola & Oladipo, 2023). In addition to their environmental benefits, traditional farming systems in Nigeria contribute significantly to food security.

Indigenous crops, such as sorghum, millet, yam, and cassava, are well adapted to local climatic conditions and are more resilient to pests and diseases compared to many introduced species. These crops are also nutritionally important, providing essential vitamins, minerals, and other nutrients that are crucial for the health of local populations (Nair, 2014, Odeyemi *et al.*, 2021). Moreover, the diversity of crops cultivated within traditional systems reduces the risk of crop failure and enhances food availability throughout the year. However, the rapid globalization and commercialization of agriculture have brought about significant changes in Nigeria's agricultural sector. The introduction of high-yielding varieties, synthetic fertilizers, and mechanized farming has also led to increased agricultural productivity in some areas. Yet, these changes have also marginalized traditional farming systems and eroded the rich knowledge base of ethno-agriculture (Eze & Nnamani, 2022). As modern agricultural practices become more dominant, there is a growing concern that the invaluable cultural heritage and sustainable practices associated with ethno-agriculture are being lost. The decline of ethno-agriculture is not only a cultural loss but also a threat to environmental sustainability. Modern agricultural practices often contribute to soil degradation, loss of biodiversity, and increased vulnerability to climate change. In contrast, ethno-agriculture offers adaptive strategies

that can help mitigate these impacts, such as the cultivation of drought-resistant crop varieties, water conservation techniques, and the sustainable management of natural resources (Akinyele & Olutola, 2023). Given these challenges and opportunities, there is a pressing need to reassess the role of ethno-agriculture in Nigeria's agricultural development. Integrating traditional knowledge with modern scientific approaches could offer a more balanced and resilient agricultural system. For instance, incorporating indigenous knowledge into formal agricultural research and extension services could enhance the relevance and effectiveness of these initiatives, particularly for smallholder farmers who are the custodians of ethno-agriculture (Nwankwo & Okeke, 2023). This review work therefore aims to explore the significance of ethno-agriculture in Nigeria's agricultural development, highlighting its contributions to sustainability, food security, and economic growth. It also addresses the challenges facing the preservation and promotion of traditional farming practices in the face of modernization and suggests pathways for integrating ethno-agriculture into national agricultural strategies.

Significance of Ethno-Agriculture for Agricultural Development in Nigeria

Ethno-agriculture plays a pivotal role in the agricultural development of Nigeria by fostering sustainability, enhancing food security, preserving biodiversity, and supporting the socio-economic well-being of rural communities. This traditional form of agriculture, rooted in indigenous knowledge systems, offers a complementary approach to modern agricultural practices and has several significant contributions to the agricultural landscape of Nigeria.

Sustainability and Environmental Stewardship

Ethno-agriculture is intrinsically sustainable due to its deep connection with local ecosystems and its reliance on traditional practices that have been refined over generations to maintain ecological balance. Indigenous farming techniques, such as crop rotation, intercropping, and the use of organic fertilizers, help to preserve soil fertility, reduce the need for chemical inputs, and promote the conservation of natural resources (Omotayo & Fadare, 2021). For instance, the practice of intercropping—growing multiple crops together in the same field—enhances biodiversity and reduces pest outbreaks, thereby minimizing the need for pesticides (Oladimeji & Adewale, 2020). This sustainable approach is crucial in the context of Nigeria's diverse and often fragile ecosystems, where the impacts of climate change and environmental degradation are increasingly felt.

Food Security and Resilience

Ethno-agriculture significantly contributes to food security in Nigeria by promoting the cultivation of indigenous crops that are well adapted to local climatic conditions and less reliant on external inputs. Crops such as yam, cassava, millet, and sorghum are staple foods in many Nigerian communities and are integral to the diets of millions of people (Odeyemi et al., 2021). These crops are not only resilient to local environmental stresses, such as drought and poor soils, but they also provide essential nutrients that are vital for the health and well-being of the population. By maintaining a diverse portfolio of crops, ethno-agriculture reduces the risk of crop failure and enhances the resilience of food systems against climate variability and economic shocks (Ikeme & Uchegbu, 2022).

Preservation of Agricultural Biodiversity

One of the most significant contributions of ethno-agriculture is the preservation of agricultural biodiversity. Nigeria is home to a rich variety of indigenous crops and livestock breeds, many of which are underutilized or at risk of being lost due to the dominance of commercial agriculture. Ethno-agriculture supports the cultivation and conservation of these diverse species, which are crucial for maintaining genetic diversity and ensuring the long-term sustainability of agriculture (Akinyele & Olutola, 2023). This biodiversity is not only important for ecological reasons but also for its potential economic value. Indigenous crops often have unique qualities, such as drought resistance or high nutritional content that make them valuable for both local consumption and global markets (Adeola & Oladipo, 2023). These traditional farming systems often incorporate a variety of landraces, wild relatives, and native species that are specifically adapted to local environmental conditions. This diversity is crucial for maintaining the resilience of agricultural ecosystems, as it helps to protect against pests, diseases, and environmental fluctuations (Altieri, Nicholls, & Montalba, 2017). The preservation of genetic diversity within ethno-agricultural systems also provides essential resources for future breeding programs, which are necessary for developing crops that can withstand the challenges posed by climate change (Jackson, Pulleman, & Snapp, 2020).

Socio-Economic Benefits for Rural Communities

Ethno-agriculture is a key driver of socio-economic development in rural Nigeria, where the majority of the population depends on agriculture for their livelihoods. Traditional farming practices are often labor-intensive and community-oriented, providing employment and income for millions of smallholder farmers (Chika & Afolabi, 2020). Additionally, the production and sale of indigenous crops can contribute to economic diversification and the development of niche markets, both locally and internationally. By promoting the cultivation and processing of indigenous crops, Nigeria can tap into the growing global demand for organic and traditional foods, thus boosting rural economies and enhancing the livelihoods of farmers (Adeola & Oladipo, 2023).

Cultural Heritage and Knowledge Preservation

Ethno-agriculture is deeply intertwined with the cultural heritage of Nigeria's diverse ethnic groups. Traditional farming practices are often linked to cultural rituals, festivals, and social structures, making them an integral part of community identity (Chika & Afolabi, 2020). The preservation of ethno-agriculture thus goes beyond agricultural productivity; it is also about maintaining cultural heritage and ensuring the transmission of valuable knowledge to future generations. This cultural dimension is crucial in a rapidly changing world, where globalization and modernization threaten to erode traditional practices and knowledge systems (Ajayi & Adeyemi, 2022). These practices help to reinforce social cohesion and ensure the transmission of knowledge from one generation to the next. The cultural significance of ethno-agriculture extends beyond food production; it encompasses a way of life that is closely tied to the land and the environment. As such, the preservation and revitalization of traditional agricultural practices are essential for maintaining the cultural identity and autonomy of indigenous peoples (Aistara, 2021).

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Contribution to Climate Change Adaptation

Ethno-agriculture offers valuable strategies for adapting to the impacts of climate change, which are increasingly threatening agricultural productivity in Nigeria. Indigenous knowledge systems include practices that enhance the resilience of farming systems to changing climatic conditions, such as the selection of drought-resistant crop varieties, water conservation techniques, and the sustainable management of natural resources (Ogunbanjo, 2021). By integrating traditional knowledge with modern scientific approaches, ethno-agriculture offers strategies for developing more climate-resilient food systems that can sustain agricultural productivity under changing environmental conditions in Nigeria (FAO, 2022, Pretty, 2008).

Empowerment of Smallholder Farmers

Ethno-agriculture plays a crucial role in empowering smallholder farmers, who make up a significant proportion of the world's agricultural producers. By relying on locally available resources and traditional knowledge, smallholder farmers can reduce their dependence on external inputs and commercial seed varieties, which are often costly and environmentally unsustainable (Berkes, 2018). Ethno-agriculture promotes self-sufficiency and enhances the economic resilience of rural communities by supporting diverse, locally adapted farming systems. Furthermore, the participatory nature of traditional agricultural practices fosters collective decision-making and resource management, which are essential for ensuring equitable access to land and other resources (Maffi, 2014).

Adaptation Strategies for Enhancing Ethno-Agriculture In Nigeria

As Nigeria faces increasing challenges from climate change, population growth, and economic pressures, adapting ethno-agriculture to these changing conditions is essential for the sustainability and resilience of the agricultural sector. Ethno-agriculture, which relies on indigenous knowledge and practices, offers valuable insights and strategies for adapting to these challenges. The following adaptation strategies can help enhance ethno-agriculture in Nigeria, ensuring its continued relevance and effectiveness in a rapidly changing world.

Climate-Resilient Crop Varieties

One of the primary adaptation strategies is the promotion and cultivation of climate-resilient crop varieties that are naturally suited to the local environmental conditions. These include:

***Drought-Tolerant Crops*:** Encouraging the cultivation of indigenous crops such as millet, sorghum, and cassava, which are naturally resistant to drought and can thrive in arid and semi-arid regions of Nigeria (Ogunbanjo,2021).

***Flood-Resistant Varieties*:** Developing and promoting traditional rice varieties that are better adapted to the increasingly frequent flooding in certain parts of Nigeria, particularly in the Niger Delta (Ikeme & Uchegbu, 2022).

***Diversified Farming Systems*:** Promoting crop diversification as a strategy to reduce the risks associated with climate variability, ensuring that farmers have multiple sources of food and income even in adverse conditions (Akinyele & Olutola, 2023).

Water Management Techniques

Effective water management is crucial for adapting ethno-agriculture to changing climatic conditions, particularly in regions prone to droughts or irregular rainfall. Strategies include:

***Traditional Irrigation Methods*:** Revitalizing and modernizing traditional irrigation methods

such as "shaduf" and "flood recession farming" that have been used for centuries to manage water resources efficiently in arid regions (Omotayo & Fadare, 2021).

***Rainwater Harvesting*:** Promoting the use of rainwater harvesting systems to collect and store water during the rainy season for use during dry periods. This can be integrated with traditional water conservation practices to maximize water availability (Ajayi & Adeyemi, 2022).

***Soil Moisture Conservation*:** Implementing techniques such as mulching, cover cropping, and agroforestry to conserve soil moisture and reduce water loss, thereby enhancing the resilience of farming systems to drought (Oladimeji & Adewale, 2020).

Sustainable Land Management Practices

Adaptation in ethno-agriculture requires sustainable land management practices that prevent soil degradation and enhance land productivity. Key strategies include:

***Agroforestry Systems*:** Promoting agroforestry, which integrates trees and shrubs into agricultural landscapes, as a way to improve soil fertility, prevent erosion, and increase biodiversity (Chika & Afolabi, 2020).

Terracing and Contour Farming: Encouraging the use of terracing and contour farming, especially in hilly areas, to reduce soil erosion, conserve water, and improve crop yields (Odeyemi et al., 2021).

***Organic Soil Amendments*:** Supporting the use of organic fertilizers, compost, and manure, which are traditional practices, to enhance soil fertility and reduce dependency on chemical fertilizers (Alteri, 2004, Nwankwo & Okeke, 2023).

Community-Based Adaptation Approaches

Community-based adaptation (CBA) involves engaging local communities in identifying and implementing adaptation strategies that are grounded in their own knowledge and experiences. These can be achieved through:

***Participatory Planning*:** Involving local farmers in the planning and decision-making processes to ensure that adaptation strategies are culturally appropriate and tailored to local needs (Adeola & Oladipo, 2023).

***Knowledge Exchange Platforms*:** Establishing platforms for the exchange of traditional and modern knowledge, where farmers can learn from each other and from experts about effective adaptation practices (Ogunbanjo, 2021).

***Resilience Building Programs*:** Implementing community resilience programs that focus on strengthening social networks, enhancing local governance structures, and providing training on disaster preparedness and response (Ikeme & Uchegbu, 2022).

Agroecological Approaches

Agroecology, which applies ecological principles to agricultural systems, is closely aligned with many traditional practices in ethno-agriculture. Adopting agroecological approaches can enhance the sustainability and resilience of farming systems. Strategies include:

***Polyculture and Crop Rotation*:** Encouraging polyculture (growing multiple crops together) and crop rotation, which are traditional practices that reduce pest and disease outbreaks and improve soilhealth (Akinyele & Olutola, 2023).

***Biological Pest Control*:** Promoting the use of natural predators and biological control agents, which are often used in traditional pest management, to reduce reliance on chemical pesticides (Oladimeji & Adewale, 2020).

***Ecosystem-Based Management*:** Integrating traditional ecological knowledge with modern science to manage entire ecosystems sustainably, ensuring that agricultural

practices support biodiversity and ecosystem services (Chika & Afolabi, 2020).

Market Access and Economic Incentives

Ensuring that farmers can access markets and receive fair compensation for their products is crucial for the sustainability of adaptation strategies. This can be achieved through:

***Market Linkages*:** Developing market linkages that connect smallholder farmers with local, regional, and international markets, particularly for niche products like organic and indigenous crops(Chika&Afolabi,2020).

***Economic Incentives*:** Providing economic incentives, such as subsidies or grants, to encourage farmers to adopt climate-resilient practices and invest in sustainable farming technologies (Ogunbanjo, 2021).

***Value Chain Development*:** Supporting the development of value chains that add value to traditional crops and create new income opportunities for farmers, such as processing, packaging, and branding (Akinyele & Olutola, 2023).

Integration of Traditional and Modern Technologies

While traditional practices are valuable, integrating them with modern technologies can enhance their effectiveness and scalability. Key strategies include:

Precision Agriculture Tools: Introducing precision agriculture tools, such as GPS and remote sensing, to optimize planting and harvesting schedules, monitor soil health, and manage resources more efficiently in traditional farming systems (Ajayi & Adeyemi, 2022).

***Seed Banks and Gene Banks*:** Establishing seed banks to preserve and propagate indigenous crop varieties, and integrating them with modern gene banks to protect genetic diversity and provide resources for breeding programs (Omotayo & Fadare, 2021).

***Mobile Technology for Information Dissemination*:** Using mobile technology to disseminate weather forecasts, market information, and best practices, helping farmers to make informed decisions and adapt to changing conditions (Nwankwo & Okeke, 2023).

Capacity Building and Extension Services

Building the capacity of farmers to adopt and adapt new practices is essential for the success of any adaptation strategy. These involve:

***Training Programs*:** Providing training programs that focus on climate-smart agriculture, sustainable farming practices, and the integration of traditional knowledge with modern techniques (Odeyemi et al., 2021).

***Empowering Extension Services*:** By expanding and improving agricultural extension services, to offer more tailored support to smallholder farmers, particularly in remote and underserved areas (Adeola & Oladipo, 2023).

***Peer Learning and Farmer Field Schools*:** Establishing farmer field schools that promote peer learning and provide hands-on training in adaptation practices, fostering a sense of community and shared responsibility (Ikeme &Uchegbu, 2022).

Challenges Facing Ethno-Agriculture in Nigeria

Ethno-agriculture, which relies on indigenous knowledge and traditional farming practices, plays a vital role in Nigeria's agricultural sector. However, despite its importance, ethno-agriculture faces numerous challenges that hinder its potential to contribute fully to agricultural development, food security, and environmental sustainability in Nigeria. The following are some of the key challenges facing ethno-agriculture in the country:

Erosion of Indigenous Knowledge

One of the most significant challenges to ethno-agriculture in Nigeria is the erosion of indigenous knowledge. This erosion is driven by several factors, including:

***Generational Gaps*:** Younger generations are increasingly moving away from traditional farming practices in favor of modern, urban lifestyles. This generational shift leads to a loss of knowledge as older farmers, who are the custodians of indigenous practices, pass away without passing on their expertise (Akinyele & Olutola, 2023).

***Westernization and Globalization*:** The influence of Western education and globalization has contributed to the devaluation of indigenous knowledge, with many perceiving traditional practices as outdated or less effective compared to modern agricultural methods (Oladimeji & Adewale, 2020).

***Lack of Documentation*:** Much of the indigenous knowledge in ethno-agriculture is transmitted orally and has not been systematically documented. This lack of documentation makes it difficult to preserve and disseminate traditional practices (Nwankwo & Okeke, 2023).

Limited Access to Resources and Technology

Farmers who rely on ethno-agriculture often face significant resource constraints, which limit their productivity and ability to adapt to changing conditions. These constraints include:

***Lack of Access to Land*:** Many smallholder farmers practicing ethno-agriculture have limited access to arable land, often due to land tenure issues and competition with large-scale commercial farming (Odeyemi et al., 2021).

***Scarcity of Financial Resources*:** Access to credit and financial resources is often limited for traditional farmers, making it difficult for them to invest in necessary inputs, such as seeds, tools, and sustainable farming technologies (Chika & Afolabi, 2020).

***Inadequate Infrastructure*:** Poor infrastructure, including roads, storage facilities, and irrigation systems, hinders the ability of ethno-agricultural practitioners to access markets, preserve their produce, and optimize water use (Ogunbanjo, 2021).

Environmental Degradation and Climate Change

Environmental degradation and climate change pose significant threats to ethno-agriculture in Nigeria. Traditional farming practices, which are often closely linked to local ecosystems, are particularly vulnerable to these challenges:

***Soil Degradation*:** Over-cultivation, deforestation, and unsustainable land use practices have led to widespread soil degradation, reducing the fertility of the land and making it difficult for traditional farmers to maintain their yields (Ajayi & Adeyemi, 2022).

***Climate Variability*:** Changes in rainfall patterns, increased frequency of extreme weather events, and rising temperatures due to climate change have disrupted traditional farming cycles, making it challenging for farmers to predict planting and harvesting times (Ikeme & Uchegbu, 2022).

***Biodiversity Loss*:** The loss of biodiversity, including the decline of indigenous crop varieties and traditional livestock breeds, undermines the resilience of ethno-agricultural systems, which rely on diverse species to adapt to changing environmental conditions (Omotayo & Fadare, 2021).

Market Access and Commercialization Challenges

Ethno-agriculture in Nigeria often struggles with market access and commercialization, which are critical for improving farmers' incomes and sustaining traditional practices:

***Limited Market Opportunities*:** Many traditional crops and products do not have well-established markets, making it difficult for farmers to sell their produce at fair prices. This is compounded by the lack of market information and the dominance of modern, commercially viable crops (Oladimeji & Adewale, 2020).

***Value Chain Gaps*:** The value chains for indigenous crops and products are often underdeveloped, with limited opportunities for processing, packaging, and branding. This limits the ability of ethno-agriculture to generate higher incomes and attract investment (Ogunbanjo, 2021).

***Competition with Modern Agriculture*:** Ethno-agriculture faces stiff competition from modern agricultural practices, which often receive more support in terms of research, subsidies, and market access. This competition can lead to the marginalization of traditional farming systems (Nwankwo & Okeke, 2023).

Policy and Institutional Barriers

Policy and institutional barriers significantly affect the viability of ethno-agriculture in Nigeria. These challenges include:

Lack of Supportive Policies: There is often a lack of explicit policies that support and promote ethno-agriculture. Instead, agricultural policies tend to favor modern, industrialized farming methods, neglecting the needs of traditional farmers (Adeola & Oladipo, 2023).

***Weak Institutional Support*:** Institutions that are supposed to support agricultural development, such as extension services, research institutions, and financial institutions, often lack the capacity or mandate to address the specific needs of ethno-agriculture (Chika & Afolabi, 2020).

***Insufficient Research and Development*:** Limited research and development efforts are focused on improving traditional farming practices or integrating them with modern technologies. This lack of investment in R&D hampers the ability to innovate within ethno-agriculture (Odeyemi et al., 2021).

Socio-Cultural Challenges

Socio-cultural factors also play a role in the challenges facing ethno-agriculture in Nigeria. These include:

***Gender Inequality*:** Women play a crucial role in traditional farming systems, yet they often face barriers to accessing land, resources, and decision-making opportunities. Gender inequality limits the full participation of women in ethno-agriculture and hinders its development (Akinyele & Olutola, 2023).

***Cultural Perceptions*:** There is often a perception that traditional farming practices are backward or inferior to modern methods. This cultural bias can lead to the stigmatization of ethno-agriculture and discourage younger generations from engaging in traditional farming (Oladimeji & Adewale, 2020).

***Migration and Urbanization*:** Rural-to-urban migration and urbanization trends are leading to the depopulation of rural areas, reducing the labor force available for traditional farming and contributing to the decline of ethno-agriculture (Nwankwo & Okeke, 2023).

Health and Labor Issues

Health and labor issues also present challenges for the sustainability of ethno-agriculture: Labor Shortages: Traditional farming is often labor-intensive, and labor shortages can arise due to factors such as migration, aging populations, and the impact of diseases such as

malaria and HIV/AIDS on rural communities (Ajayi & Adeyemi, 2022).

***Health Risks*:** Some traditional practices may pose health risks to farmers, such as the use of un safe tools or exposure to harmful pests and diseases. These risks can reduce productivity and discourage participation in ethno-agriculture (Ogunbanjo, 2021).

***Lack of Healthcare Access*:** Limited access to healthcare in rural areas exacerbates the impact of health issues on farming communities, further weakening the capacity of ethno-agriculture to sustain itself (Odeyemi et al., 2021).

Conclusion

Ethno-agriculture, deeply rooted in Nigeria's rich cultural and historical heritage, holds significant potential for advancing sustainable agricultural development, ensuring food security, and preserving biodiversity. The way forward for ethno-agriculture lies in recognizing its value and integrating its principles into broader agricultural development strategies. By combining traditional knowledge with modern innovations, supporting policies and education, promoting agroecology, and empowering communities, ethno-agriculture can contribute significantly to sustainable agricultural development. As we face the challenges of the 21st century, including climate change, food insecurity, and biodiversity loss, ethno-agriculture offers a pathway towards more resilient, equitable, and sustainable food systems. However, the effectiveness of ethno-agriculture is contingent upon overcoming various obstacles, including the erosion of traditional knowledge, limited access to resources and technology, environmental degradation, and inadequate policy support.

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