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An Analysis of Federal Government Policy on Organic Agriculture in Nigeria

Professor Moses Shaibu Faruna
Professor of International Relations, Institute for International Affairs, Nigeria

Abstract - This paper examines Nigeria's federal policy framework on organic agriculture, emphasizing its opportunities, challenges, and relevance for food security and sustainability. Organic farming, which avoids synthetic inputs in favour of natural processes, improves soil fertility, reduces costs, promotes health, and enhances resilience to climate change. While demand in Nigeria is driven by health, export, and sustainability concerns, government policies remain focused on conventional farming, offering only limited indirect support. Civil society groups, regional frameworks such as ECOWAP, and state-level initiatives have helped bridge policy gaps. Major national innovations like Joevet Powder Organic Pesticide and Ecofarmsillustrate the potential of local organic solutions in pest management without environmental or health risks. However, adoption remains constrained by high certification costs, weak institutional support, low awareness, and limited market access. The study concludes that organic agriculture offers Nigeria a viable path to sustainable development and global market competitiveness. Realizing this potential requires stronger government commitment, policy reforms, financial and market incentives, and investment in research and capacity building.

Keyword - Joevet Powder, Organic Pesticide, Subsidies, Extension Service, and Superior Bay Leaves

INTRODUCTION

Organic farming, described as a system of production that avoids synthetic inputs and relies instead on natural processes, is increasingly acknowledged for its role in strengthening food security, promoting environmental sustainability, and safeguarding human health (IFOAM, 2022). In Nigeria, where food insecurity, ecological degradation, and socio-economic difficulties remain pressing, organic agriculture represents a promising pathway to sustainable development.

The practice contributes to soil restoration, lowers production costs in the long run, provides access to premium markets, and enhances resilience to climate change. In West Africa, and Nigeria in particular, the growing interest in organic systems is motivated by consumer health concerns, export opportunities, and sustainability objectives. However, federal agricultural policies in Nigeria have traditionally focused on boosting conventional productivity, with only limited recent efforts indirectly supporting organic farmingsuch as initiatives on fertilizer quality control and the establishment of standardization committees. Consequently, civil society groups and regional bodies have played a vital role in filling these policy gaps, including efforts by Ogun State and the Economic Community for West African Agricultural Policy (ECOWAP).

The Codex Alimentarius Commission defines organic agriculture as a holistic management approach that excludes synthetic fertilizers, pesticides, and genetically modified organisms. Its primary goal is to minimize pollution in air, soil, and water while promoting the well-being and productivity of interconnected systems of plants, animals, and humans, (Codex, 2001).

Organic practices are not new; early farming by our ancestors relied entirely on natural inputs and traditional methods. With the advancement of agricultural science and the growth of the human population, the demand for food increased. The Green Revolution, particularly in countries such as Indonesia, significantly boosted food supply by encouraging the use of high-yielding crop varieties, pesticides, synthetic fertilizers, and intensive land use, (Manurung, Nusantara, Umaran&Warganda, 2021). However, the excessive use of these inputs has led to serious challenges, including land degradation, pollution from agrochemicals, and negative impacts on both human health and the environment, (Yamani, 2010). While synthetic fertilizers were originally developed to improve soil fertility, their widespread application has resulted in long-term ecological damage and health risks. In response, new approachessuch as organic, sustainable, or ecological agriculturehave emerged to mitigate and eventually eliminate these harmful effects, (Aksoy, (2021); Chowdhury, 2004).

Organic nutrient sources, derived mainly from plant and animal matter, are essential in this system. Microbial fertilizers, in particular, are cost-effective, lightweight, environmentally safe, and play a crucial role in plant nutrition, (Mahajan, Gupta &

Sharma, 2008). Compared to synthetic fertilizers, organic fertilizers are often more accessible and affordable at the local level,(Solomon, Ndana, and Abdulrahim, 2012), since soil fertility depends largely on organic matter, (Aboudrare, 2009). These fertilizers enhance soil health by breaking down organic residues into inorganic nutrients through microbial activity. This process enriches the soil with organic matter, increases its carbon content, improves ion exchange capacity, and stimulates microbial functions. Like chemical fertilizers, organic fertilizers also enhance crop yield and quality, but without the associated environmental costs, (Bulluck et al., 2002).

Organic farming therefore emphasizes the management of soil organic matter to enhance the soil's chemical, biological, and physical properties, (Berntsen, Grant, Olesen, Kristensen, Vinther, and Molgaard, 2006). Organic matter not only supports soil quality (Reeves, 1997) and health (Lal, 2016) but also influences crop productivity through its interaction with various soil processes. Importantly, these improvements occur without polluting the environment. Because of its positive effects on soil systems, organic matter content is considered a key indicator of soil health, (FAO, 2006).

The effectiveness of Joevet Powder Organic Pesticide and related organic farming practices lies in their ability to first affect the sensory organs and overall body system of pests, rendering them inactive. Upon application, the solution causes immediate discomfort, leading to writhing and repulsion among insects, rodents, and other pests present in the treated environment. This action ensures that organisms within warehouses, storage facilities, and PICS bags, as well as those found on stored grains, are either killed or repelled. Research indicates that nearly 90% of insects, rodents, and animals instinctively avoid substances that are bitter, pungent, or toxic. Importantly, these organic solutions are non-lethal to humans.
In contrast, the widespread use of chemical preservatives and pesticides in storing vegetables, cowpea, and grains across West Africa has exposed consumers to significant health risks and caused widespread environmental damage. The drive to maximize output with minimal input through synthetic chemicals has resulted in harmful consequences, including incurable diseases such as cancer and ulcers. Additionally, inorganic chemicals degrade soil components, leading to erosion, biodiversity loss, and contributions to climate change, which in turn causes extensive destruction of lives and property worth millions of Naira globally.

In response to these challenges, a partnership initiative developed a homemade organic fertilizer and natural crop protection solution known as the "Bitter Pepper Solution" in 2012. Initially tested in selected communities across Jos, Bauchi, Adamawa, Borno, Taraba, and Gombe States, the solution produced impressive results. The success of these trials encouraged further research, which later identified "Superior Bay Leaves" as highly effective in pest control. Combining this discovery with the original formula led to the development of Joevet Powder Organic Pesticide, a fully organic solution that is 100% chemical-free and made entirely from locally sourced materials, often obtainable from household gardens.

Joevet Powder has, so far, been adopted by over 17.5 million individuals, small- to medium-scale farmers, and cooperative societies nationwide to protect flowering crops and stored grains from insect infestation, ensuring product quality preservation. Its introduction is further supported by emerging technologies designed to enhance efficiency, adoption, and sustainability.

Historically, Nigerian agriculture before colonial times relied on organic methods, utilizing natural inputs such as animal manure and ash rather than chemical fertilizers and pesticides (Showers, 2006). While sustainable and adaptable, these systems were not equipped for large-scale production due to the absence of modern government and institutional frameworks. This review therefore examines Nigeria's agricultural policies—both organic and conventionalhighlighting the structures in place, the gaps that exist, and the broader implications for sustainability and food security.

Currently, conventional farming dominates the Nigerian agricultural sector, supported heavily by government subsidies, extension services, and policy backing (Mustapha, Bzugu and Sanusi, 2012; Agunbiade, 2013). It remains the primary approach to addressing food security (Adepoju,Esan and Akinyomi, 2022). Modern technologies such as mechanized equipment and irrigation systems have improved yields but at significant environmental costs. Many Nigerian farmers and consumers, unaware of the long-term effects of these practices, continue to rely on conventional methods despite the associated risks of soil degradation, food contamination, and health issues. As a result, sustainable alternatives have limited markets (Pretty, 2008), allowing conventional practices to persist.

Agricultural research in Nigeria also prioritizes conventional farming, with universities and government programs emphasizing high-yielding varieties, pest-resistant crops, and synthetic fertilizers. This emphasis has limited the advancement of sustainable approaches. Even when conventional technologies are developed, smallholder farmers often adopt them slowly due to barriers such as poor information dissemination, limited access to inputs, and the high cost of mechanized practices. Moreover, weak regulatory

enforcement contributes to the excessive use of agrochemicals, aggravating health hazards and environmental degradation, thereby undermining the long-term sustainability of the sector (Warra & Prasad, 2020; Fajemirokun, 2024).

Policy implementation in Nigeria's agricultural sector also faces significant challenges, particularly within the underdeveloped organic farming segment. Policies are often poorly executed, leading to minimal impact. A major constraint is inadequate funding, worsened by economic downturns, inflation, and competing budgetary demands. While both organic and conventional farming face resource limitations, the latter receives far more support, particularly through subsidies for synthetic fertilizers, pesticides, and improved seed varieties. In contrast, organic agriculture receives little financial backing (Dabbert et al., 2004; Ade-Oluwa et al., 2017), partly due to its lower adoption rates (Atungwu et al., 2016). These adoption challenges are compounded by relatively lower yields, which result in higher product prices compared to conventional produce, reducing competitiveness. Additional barriers to the growth of organic agriculture include low awareness, limited political support, weak government commitment, and financial constraints (Ade-Oluwa et al., 2017).

Nigeria's bureaucratic structure poses significant obstacles to the effective implementation of agricultural policies. Its decentralized nature often results in duplication of efforts, delayed decision-making, and inefficient execution (Adetunji, 2022). Corruption and the misallocation of resources within government institutions further weaken agricultural policy outcomes, negatively impacting both conventional farmers and organic agriculture. In addition, poor coordination between Federal and State governments frequently undermines implementation, leading to regional disparities caused by differing priorities and levels of commitment (Allain-Dupré, 2018).

Much of the progress in promoting organic agriculture has been driven by international donors and nongovernmental organizations (NGOs) rather than government-led initiatives. This dependence creates uncertainty in policy continuity, as donor funding is subject to shifting priorities. Moreover, Nigeria's institutional framework for organic agriculture remains underdeveloped and is still at an early stage of policy implementation (Loconto et al., 2016; Ozor & Amudayi, 2021). Organizations such as the Nigeria Organic Agriculture Network (NOAN) and the Organic Agriculture Project in Tertiary Institutions in Nigeria (OAPTIN) have played a key role (Atungwu et al., 2016), yet the absence of a unified national body to oversee the regulation, development, and promotion of organic agriculture remains a critical gap (Ozor & Amudayi, 2021).

II. LITERATURE REVIEW

Organic Fertilizer

Organic fertilizers are natural inputs with defined chemical compositions and high nutrient content that provide essential elements for plant growth, (Jarvis, Stockdale, Shephard, Powilson, 1996). They are typically produced by composting animal manure, human waste, and plant residues (such as straw or garden refuse) under high-temperature fermentation facilitated by microorganisms. These fertilizers not only improve soil structure but also supply diverse nutrients and beneficial microbes, thereby enhancing soil health and boosting crop yields (Chew, Chia, Yen, &Nomanbury, 2019).
(Sarka et al, 2003), highlighted the potential of organic fertilizers to improve both plant productivity and environmental sustainability, (Sarka, Singh & Singh, 2003). Similarly, (Chew et al., 2019) identified common raw materialsincluding animal manure, household waste, municipal refuse, crop residues, and plant componentsthat can be composted into organic fertilizers, which are valued for increasing soil organic matter and providing a slow release of nutrients. Abbott and Murphy emphasized their role in improving soil organic matter (SOM), nutrient availability, structure, and microbial activity, all of which significantly enhance crop productivity, (Abbott & Murphy, 2007).

According to Ogbalu, organic fertilizers also influence the soil's cation exchange capacity (CEC), contributing to better texture, improved water retention, and reduced erosion, (Chukwu et al., 2012). Unlike synthetic fertilizers, they do not burn plant roots or destroy beneficial microorganisms, while still providing nitrogen in plant-available forms that support growth. In addition to meeting plant nutrient requirements, organic fertilizers help strengthen plant tolerance and reduce susceptibility to diseases. Plant-based wastes such as wood ash, rice bran, spent grain, and sawdust have proven effective in this regard, (Asadu&Unagwu, 2012). Although traditional nutrient sources remain accessible, artificial fertilizers are often less frequently used in rural communities, (Asadu & Unagwu, 2012).

Haynes confirmed that organic fertilizers sustain yields and preserve long-term soil productivity, (Haynes, 2005). Similarly,(Abeco, 2024) demonstrated that the application of organic resources such as cow dung, poultry droppings, and farmyard manure effectively increases crop yields.

Global Context of Organic Farming Policies

Worldwide, the promotion of organic agriculture is supported by a variety of policy measures aimed at advancing sustainable farming systems. These measures generally include certification programs, subsidies, and educational initiatives that encourage the adoption and expansion of organic practices (Willer, Trávníček& Schlatter, 2022). Certification schemessuch as those developed by the International Federation of Organic Agriculture Movements (IFOAM)are especially important for ensuring the credibility of organic products, strengthening consumer trust, and creating broader market opportunities for producers (IFOAM, 2022).

In many developed countries, supportive policies have produced notable results. Financial incentives such as grants and subsidies make organic farming more attractive by offsetting the comparatively higher costs associated with organic production. These costs typically include certification fees, organic seed procurement, and the labor demands of avoiding synthetic inputs (Lohr & Park, 2010). Within the European Union, the Common Agricultural Policy (CAP) has been central to advancing organic agriculture by providing direct financial support to farmers who follow organic practices (European Commission, 2021). This support helps cover expenses related to certification, inputs, and infrastructure, making the transition to organic farming more feasible. As a result, organically farmed land across EU member states has steadily expanded. Beyond financial support, the CAP also funds agri-environmental schemes that reward farmers for delivering public goods such as biodiversity preservation, improved soil health, and water conservation (Lampkin, Pearce, Leake, Creaney, White, & Schmid, 2015). These initiatives align organic farming with the EU's wider sustainability and environmental objectives (Willer & Lernoud, 2020).

The United States offers similar support mechanisms. The Organic Certification Cost Share Program (OCCSP), for example, reimburses up to 75% of certification costs, capped at $750 per certification scope (USDA, 2021). This program lowers financial barriers, particularly for small and medium-sized farms, and has contributed to steady growth in both the number of certified organic farms and the acreage under organic cultivation. In addition to subsidies, the U.S. government invests heavily in research and development. The Organic Agriculture Research and Extension Initiative (OREI) funds projects designed to enhance the competitiveness of organic farming by developing improved production methods, pest management strategies, and soil health practices (National Institute of Food and Agriculture, 2020).

Marketing support also plays a role in policy frameworks. Denmark, for instance, has implemented a national marketing strategy that includes awareness campaigns, labelling systems, and export promotion for organic products (European Environment Agency, 2019). These efforts have helped stabilize demand and create secure markets, which in turn motivate more farmers to transition to organic practices.

Educational programs form another cornerstone of organic farming promotion. By providing farmers with practical knowledge and technical training, they help ensure the successful adoption and maintenance of organic methods. Governments and NGOs frequently sponsor such programs, offering advisory services, workshops, field demonstrations, and resource materials. In Germany, for example, the Federal Ministry of Food and Agriculture (BMEL) runs initiatives that train farmers in soil management, pest control, and crop rotation, while also fostering networks for peer-to-peer knowledge exchange (BMEL, 2021; Willer & Lernoud, 2020). Denmark has also built a strong educational infrastructure, led by the Danish Agriculture and Food Council's Organic Farming Knowledge Center, which provides consultancy and training in organic crop production, livestock management, and market access (Økologisk Landsforening, 2019). These services not only address the specific challenges faced by farmers but also make the transition to organic farming more manageable and sustainable.

Educational initiatives in organic farming extend beyond traditional classroom instruction, often incorporating handson, experiential learning. Farm visits and practical demonstrations enable farmers to observe established organic systems in action, providing them with the confidence and practical understanding needed to implement new techniques on their own farms (European Environment Agency, 2019). Peer-to-peer learning is also emphasized, where farmers exchange experiences and best practices, thereby enriching the overall learning process (Soil Association, 2020). An example of an educational initiative on organic farming is the recently launched project by Michael Ibe and Joseph Ngala, top leaders in the humanitarian space, which targets 150,000 smallholder farmers on training focused on organic pesticides production, application and distribution (sale) for household economic improvement.

These programs are usually designed with local realities in mind, ensuring that training is relevant to specific environmental, economic, and social conditions. For instance, in Southern Europewhere drought is a major concern initiative focus heavily on water management (Padel & Niggli, 2008). Conversely, in Northern Europe, the emphasis tends to be on

soil health and biodiversity conservation, reflecting different agricultural challenges and priorities (Willer, Trávníček& Schlatter, 2022).

Beyond government and NGO interventions, academic institutions play a pivotal role in advancing organic farming knowledge. Universities and agricultural colleges offer specialized programs and research opportunities, preparing the next generation of organic farmers and researchers while driving innovation in the sector (IFOAM, 2022). These institutions often collaborate with policymakers, farmers, and industry stakeholders to align their curricula and research with sector needs. At the international level, organizations such as the Food and Agriculture Organization (FAO) and IFOAM contribute by disseminating technical resources, training materials, and online courses accessible worldwide. These resources support farmers in navigating certification requirements, improving market access, and adopting sustainable practices (FAO, 2021; IFOAM, 2022).

The demonstrated success of organic farming policies in developed countries highlights their potential relevance for developing nations, where agriculture remains central but is often characterized by low productivity and reliance on traditional methods. Developed economies have successfully advanced organic farming through tools such as subsidies, certification, and educational programs. Similar strategies could be transformative in contexts like Nigeria, where farmers face barriers related to financing, technical knowledge, and market integration (Willer & Lernoud, 2021).

Financial support has been particularly effective in easing farmers' transition to organic systems. For example, the European Union's Common Agricultural Policy (CAP) provides subsidies that help cover the costs of certification, organic inputs, and ongoing farm management. These measures not only reduce the financial burden of conversion but also sustain long-term adoption (European Commission, 2021). Introducing comparable support mechanisms in Nigeria could make organic farming more economically feasible for smallholder farmers (Parrott & Marsden, 2002).

Education has also proven essential. In countries such as Germany and Denmark, comprehensive training and advisory services equip farmers with the knowledge to manage soil, control pests, rotate crops effectively, and market organic products (Lampkin, Pearce, Leake, Creaney, White, & Schmid, 2015). Implementing similar programs in Nigeria could significantly build farmers' capacity, improve productivity while reduce environmental degradation (Christopher, Oyinade, Afanwoubo, &Ukadike, 2024). Just as mentioned hitherto, there are examples of organizations which embark on education for the farmers. These include US Catholic Relief Services Nigeria, FAO, AFEX, ThriveAgric, Caritas Nigeria, Crestmark, Heifas, Gyettibello, Sasakawa Nigeria, JDPC Maiduguri, amongst others. Collectively, over 3.5m farmers are trained nationwide annually by these organizations.

Certification schemes are another cornerstone, as they guarantee compliance with organic standards and open access to premium domestic and international markets. In Nigeria, a strong certification framework could not only enhance farmers' income but also build consumer trust in the authenticity of organic products (IFOAM, 2022; Parrott & Marsden, 2002).

Finally, the broader success of organic farming in developed economies has been supported by integrated policy frameworks that align agricultural practices with sustainability goals. These include funding for research, support for organic value chains, and platforms that encourage collaboration among stakeholders (Lampkin, Pearce, Leake, Creaney, White, & Schmid, 2015). By adopting a similarly holistic approach, Nigeria could create a more enabling environment for organic farmingadvancing food security, rural development, and environmental protection (Christopher, Oyinade, Afanwoubo, &Ukadike, 2024). However, successful adaptation requires tailoring these strategies to Nigeria's socio-economic realities, climatic conditions, and existing farming traditions (Parrott & Marsden, 2002). With such adjustments, organic agriculture could become a key driver of sustainable development and national well-being (IFOAM, 2022).

The success of agricultural policies depends on several key factors, including the availability of institutional support, the effectiveness of policy implementation, and the presence of supportive market systems (Scialabba & Müller-Lindenlauf, 2010). While financial incentives and certification can encourage adoption, they are most effective when combined with strong educational programs that equip farmers with the technical skills required to manage organic systems successfully (Willer & Lernoud, 2020). Furthermore, for developing countries, ensuring viable markets for organic products is essential, which often demands substantial investments in infrastructure and market development (Sahota, 2019).

Conventional Agriculture Policies in Nigeria

The introduction of cash crops such as cocoa, groundnuts, cotton, and palm oiloriginating from South America, tropical and subtropical regions of Africa, America,India and the rainforest areas of West Africa marked Nigeria's transition toward conventional agriculture, heavily influenced by colonial and post-independence policies (Hammons et al., 2016). To strengthen food security, the Nigerian government launched initiatives such as Operation Feed the Nation in the 1970s and

the Green Revolution Program in the 1980s.More recently, this policy trajectory has been continued with the launch of the National Agricultural Technology and Innovation Policy (NATIP) 2022–2027, designed to modernize Nigeria's agricultural sector through mechanization, digital innovation, and climate-smart practices (FMARD, 2022). These programs promoted conventional farming by offering subsidies, improved seed varieties, and credit facilities. The introduction of mechanized equipment such as tractors and irrigation systems further boosted agricultural productivity.

The most effective manures for raising the pH of acidic soils and stabilizing pH fluctuations are those rich in carbonate and organic matter. Organic matter remains one of the most critical determinants of soil fertility and quality, (Lehmann, Bossio, Kogel, Knabrier, & Rilling, 2020). High-quality compost derived from animal by-products is considered a safe fertilizer because it contains low levels of soluble salts, carries minimal risks of plant pathogens, releases nutrients slowly, and contributes significantly to humus formation, (Raghavendra, Sharma, Ramesh, Agnthotri, Billore & Verma. 2020).

Organic matter is one of the three fundamental components of soil, influencing its physicochemical properties, including buffering capacity, structural support, biodiversity, and biological activity. Because of its multiple benefits, preserving or enhancing organic matter is essential for maintaining soil functionality, (Möller andSchultheiß, 2015). For example, compared with unmanaged areas, soils regularly treated with bovine manure were softer and less compacted underfoot (Campbell). Organic fertilizersnatural materials with sufficient nutrient content to improve soil healthare widely recognized as effective soil amendments, (Chew,Chia, Yan, WamanbharyHo, 2019:Brar, Singh, Singh, and Kaur, 2015).
Organic fertilization offers a sustainable approach to soil management by supplying diverse nutrients needed for plant growth (Brar, Singh, Singh, and Kaur, 2015;Zhou, Zhang, Jiang, Xiu, Zhao, Yang, 2022). Research shows that organic fertilizers alter soil cation exchange capacity (CEC), soil organic matter (SOM), and acidity, while also improving soil moisture retention. Increasing SOM simultaneously raises soil organic carbon (SOC), which is essential for nutrient cycling and the availability of both macro- and micronutrients, (Gentile, Vanlauwe, Chivenge, and Six 2008). Consequently, organic fertilization strengthens the resilience of degraded soils and promotes the long-term sustainability of soil health, (Lal,2016).

Importance of Organic Fertilizer for Balanced Nutrient Supply
Organic fertilizers provide all essential crop nutrients—including macronutrients (N, P, K, S, Ca, Mg) and micronutrients (B, Cl, Cu, Fe, Mn, Mo, Ni, and Zn)in balanced proportions, something that inorganic fertilizers rarely achieve. During decomposition, these nutrients are released into the soil as part of the breakdown of organic biomass. However, organic fertilizers often contain lower nutrient concentrations, requiring larger application volumes to meet crop needs (Timsina, 2018). Additionally, nutrient release occurs gradually, with only a portion available within a single growing season.

The Role of Organic Fertilizer in Crop Yield
Organic farming is widely considered more resilient and capable of sustaining yield stability, (Timsina, 2018). One explanation is the application of organic amendments, which improve soil organic matter and enhance yields under drought conditions, (Bello, Alayafi, Solaiman, and Abo-Elyous, 2021). Diverse crop rotations also contribute to stable yields, (Tesfaye, Zaidi, Gbegbelegbe, Boeber, Rahut, Getenah, Seetharan, Erenstein, andStirling,2017). Applying organic fertilizers has proven effective in boosting yields, particularly in stressful environments. Research highlights their role in improving crop resistance to abiotic stresses such as heavy metals, salinity, heat, and drought, (Gentile, Vanlauwe, Chivenge, and Six, 2008). Combining organic with inorganic fertilizers is recommended to sustain ecosystems, improve soil quality, and optimize yields, (Diacono andMontemuro 2010). By increasing SOM, organic fertilizers enrich soil fertility and structure,(Liu, Yan, Mei, He,Bing, and Ding2010), (Bauer & Black 1992), especially in nutrient-poor environments where chemical fertilizer use is limited,(Schjønning, Jensen, Bruun, Jensen, Christensen, Munkholm, Oelofse, Baby, and Knudsen. 2018). Higher SOM levels reduce dependence on mineral nitrogen and improve overall soil health, which is particularly important for degraded soils [49]. Furthermore, organic amendments enhance microbial diversity and abundance, supplying microorganisms with energy sources that foster soil biological activity, (Linquist 2012; Riya, 2015).

The Role of Organic Fertilizer in Climate Change Mitigation
The use of organic fertilizers significantly influences greenhouse gas (GHG) emissions. Studies indicate that they can reduce emissions by lowering reliance on synthetic nitrogen fertilizers, which are energy-intensive to produce, and by improving nitrogen use efficiency (NUE) in fields, (Riya, 2015;Wei, 2016; andSlave and Man, 2012). In compacted or poorly drained soils, organic fertilizers improve aggregation and infiltration, reducing surface waterlogging and flood risks. Organic matter also promotes carbon sequestration, preventing its release as CO_2 or CH_4 and thereby mitigating global warming, (Sun, Qiu, Gao, M., Shi, M., Zhang, H., & Wang, 2019).

By decreasing dependence on chemical fertilizers, organic fertilizers help prevent soil degradation while supporting crop yield and quality, (Zhang, Zhuang, Shan. Zhao, Li and Wang, 2019), (Serri, Souri, &Rezapunah, 2021). They also enhance microbial diversity, biomass, and activity, (Zhang, Li, &Xiong, (2016), which improves soil resilience and contributes to climate protection by increasing carbon storage in agricultural ecosystems, (Bhattacharya et al., 2020).

Organic Farming in Nigeria: Current Status

In Nigeria, organic farming is still at an early stage, with limited farmer adoption despite the country's vast agricultural potential (Fakayode et al., 2021). Policies and initiatives have been introduced, but their impact has been constrained by multiple challenges. Government efforts have focused on certification incentives, input subsidies, and research support. Certification, essential for accessing premium markets, is encouraged through subsidies that offset high certification costs, making the process more accessible to smallholder farmers (Ogunsumi & Adeola, 2020).

Similarly, subsidies for organic inputs such as fertilizers, seeds, and biopesticides help reduce the financial burden of transitioning to organic practices (Ume et al., 2023). This is particularly significant in Nigeria, where access to quality inputs is often expensive and limited. The government has also supported research and extension services to generate and disseminate knowledge on organic practices, pest control, soil conservation, and region-specific challenges (FAO, 2019; Emeanaa et al., 2017).

Furthermore, Nigeria has sought to align its agricultural strategies with global sustainable farming trends. This alignment not only strengthens domestic food security and environmental sustainability but also provides Nigerian farmers with opportunities to access international organic markets (FAO, 2019; Familusi et al., 2023). By adopting international best practices, Nigeria aims to expand the competitiveness of its organic products while supporting rural livelihoods and sustainable agricultural development. When compared to the preponderance of synthetic options, only an extremely few fully organic inputs have been certified in Nigeria, notably organic fertilizers as produced and marketed Ecofarms, and Joevet powder as produced and marketed by Crestmark and Gyettibello.

Opportunities for Organic Agriculture Development

Despite existing challenges, organic agriculture presents Nigeria with several promising opportunities. The expanding global organic market offers the country a chance to access this lucrative sector, provided adequate government policies, subsidies, and interventions are in place. Organic agriculture also fosters sustainable farming practices that safeguard the environment, restore soil fertility, and improve public health outcomes (Ade-Oluwa, 2021). Furthermore, scaling up organic farming adoption in Nigeria can create employment opportunitiesparticularly in rural areasthrough the establishment of organic farms, processing centers, and value-added enterprises.

Challenges in Promoting Organic Farming in Nigeria

Although organic farming offers multiple benefitsranging from sustainability and improved health to economic opportunitiesits expansion in Nigeria faces several obstacles:

1. High Certification Costs: Obtaining organic certification remains one of the biggest barriers. Certification, which grants farmers access to premium markets, involves costly inspections, compliance measures, and maintenance fees. These expenses are often unaffordable for smallholder farmers, restricting their participation and limiting the sector's growth (Familusi, et al., 2023; Ogunsumi & Adeola, 2020).

Limited Market Access: Even certified farmers struggle with poor marketing and distribution infrastructure. With limited access to reliable buyers and profitable outlets, farmers are often unable to sell their products at premium prices, weakening incentives to remain organic and stunting sectoral growth (Ume et al., 2023).

Lack of Awareness and Technical Knowledge: Many Nigerian farmers lack sufficient knowledge of organic practices and their long-term benefits. Without technical expertise in pest control, soil fertility management, and certification standards, transitioning to organic farming becomes difficult (Emeanaa et al., 2017; Ogunsumi& Adeola, 2020).

Insufficient Financial Support: Existing subsidies and financial mechanisms are inadequate. Farmers often struggle to cover the costs of organic inputs, certification

III. DISCUSSION OF RESULTS

The findings demonstrate that organic farming presents multiple benefits for Nigeria and West Africa. Most notably, the practice contributes significantly to soil restoration, reduces production costs over time, creates opportunities to access premium international markets, and enhances resilience to climate change. These outcomes confirm earlier studies that link organic systems with long-term sustainability and food security (Ade-Oluwa, 2021).

In West Africa and Nigeria in particular the growing demand for organic products is largely driven by consumer health concerns, export opportunities, and sustainability objectives. This suggests that beyond environmental gains, organic farming also holds substantial economic and social relevance. However, the results highlight that Nigeria's federal agricultural policies continue to prioritize conventional productivity, with only limited indirect support for organic agriculture. Examples include fertilizer quality control initiatives and standardization committees, which, while important, remain insufficient to fully support the sector. Consequently, civil society organizations, state-level actors such as Ogun State, and regional frameworks like ECOWAP have emerged as critical players in bridging policy and implementation gaps.

The Codex Alimentarius Commission's definition of organic agriculture as a holistic system that excludes synthetic fertilizers, pesticides, and genetically modified organisms provides a global benchmark. When aligned with this standard, the Nigerian context reveals both opportunities and weaknesses. For instance, the effectiveness of locally developed innovations such as Joevet Powder Organic Pesticide illustrates the potential of organic solutions in addressing pest problems without endangering human health or the environment. The adoption of such products validates the argument that organic systems can deliver practical, locally adaptable outcomes, particularly in storage and pest management.

The results also confirm that excessive reliance on synthetic fertilizers and pesticides as encouraged during the Green Revolution has led to severe ecological and health challenges, including land degradation, soil erosion, biodiversity loss, and pollution. In contrast, organic fertilizers, derived from plant and animal matter, were shown to enhance soil organic matter, microbial activity, and nutrient cycling. These improvements directly influence soil fertility, crop yield, and resilience to environmental stresses such as drought and salinity. Importantly, these outcomes were achieved without contributing to pollution, highlighting organic farming's alignment with climate change mitigation strategies through carbon sequestration and reduced greenhouse gas emissions.

Despite these advantages, the findings reveal persistent challenges hindering organic farming adoption in Nigeria. High certification costs, limited market access, inadequate financial support, and insufficient technical knowledge remain major barriers for smallholder farmers. These challenges, coupled with the federal government's stronger emphasis on conventional systems, contribute to slow adoption rates and reduced competitiveness of organic products.

Overall, the results indicate that while organic farming provides a sustainable pathway for Nigeria's agricultural future, the sector's growth depends on stronger institutional support. Integrating lessons from developed countries such as the European Union's subsidy schemes for organic inputs and certification could significantly enhance adoption. If adequately supported, organic agriculture has the potential to transform Nigeria's food systems by improving rural livelihoods, promoting public health, and positioning the country competitively within the global organic market.

IV. CONCLUSION

Organic farming holds significant promise for Nigeria, offering pathways to restore soil fertility, reduce long-term production costs, access premium global markets, and build resilience against climate change. In Nigeria, growing consumer health concerns, export opportunities, and sustainability objectives continue to drive interest in organic systems, even though federal agricultural policies remain heavily skewed toward conventional farming. Limited government efforts such as fertilizer quality control initiatives and standardization committees have only marginally supported the sector, leaving civil society groups, regional frameworks, and state-led initiatives such as those in Ogun State to fill critical gaps.

Drawing from traditional practices, scientific advancements, and locally developed solutions such as Joevet Powder Organic Pesticide, Nigeria has clear opportunities to advance organic agriculture in ways that align with both historical roots and modern sustainability goals. While challenges persist particularly high certification costs, weak financial support, limited awareness, and poor policy implementation the benefits of organic practices in safeguarding public health, improving soil systems, and protecting the environment are undeniable. With stronger government commitment, enhanced institutional coordination, and increased support for research, education, and market access, Nigeria can unlock the full potential of organic agriculture. Doing so would not only strengthen food security and rural livelihoods but also position the nation as a competitive player in the expanding global organic market.

Recommendations

In light of the findings, several policies, institutional, and practical measures are necessary to strengthen organic farming in Nigeria and West Africa:

- Policy Reforms and Government Commitment

The Federal Government should design and implement a comprehensive organic agriculture policy framework that clearly distinguishes organic farming from conventional agriculture.

Subsidies and incentives should be extended to organic inputssuch as biofertilizers, biopesticides (e.g., Joevet Powder), and organic seedsin the same way synthetic fertilizers and chemicals are supported under conventional systems.

Government agencies should integrate organic farming into existing agricultural strategies to promote sustainability, food security, and environmental conservation.

- Financial and Market Support

Establish low-interest credit schemes and grants specifically for smallholder organic farmers to cover certification, input acquisition, and farm management costs.

Strengthen domestic and export market structures through improved logistics, processing, and distribution channels to help organic farmers access premium markets.

Introduce government-backed cooperatives and marketing boards to stabilize prices and enhance competitiveness of organic products.

- Capacity Building and Awareness Creation

Expand educational and extension services to disseminate knowledge on organic soil fertility management, pest control, certification standards, and climate-smart practices.

Partner with NGOs, universities, and research institutions to train farmers, extension officers, and processors in organic methods.

Launch nationwide awareness campaigns highlighting the health, environmental, and economic benefits of organic agriculture to increase consumer demand.

- Research and Innovation

Encourage and fund research into locally adaptable organic solutions, including microbial fertilizers and indigenous pest control methods.

Support the scaling up of proven local innovations such as Joevet Powder Organic Pesticide and Bitter Pepper Solution for both farm and storage applications.

Establish collaborative research programs between Nigerian universities, international organizations (e.g., FAO, IFOAM), and local farmers to address region-specific challenges.

- Institutional Strengthening and Regulation

Improve coordination between federal and state governments to avoid duplication and ensure equitable support across regions.

Strengthen regulatory bodies to enforce organic standards, certification processes, and quality control, in line with Codex Alimentarius guidelines.

Promote transparency and accountability in agricultural funding to reduce corruption and misallocation of resources.

- Climate Change Mitigation and Environmental Protection

Integrate organic farming practices into Nigeria's climate action plans as a tool for carbon sequestration and greenhouse gas reduction.

Encourage the adoption of organic amendments and crop rotations that enhance soil resilience to drought, salinity, and heat stress.

Promote ecosystem restoration through organic matter management, biodiversity conservation, and reduced reliance on agrochemicals.

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