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FOOD SCIENCE AND TECHNOLOGY PROFESSIONAL PRACTICE UPGRADE/SPECIALIZED CAPACITY DEVELOPMENT PROGRAMME FOR FOOD SCIENCE AND TECHNOLOGY PROFESSIONALS

PAPER 4B

Nigeria Agricultural Policies and Post-Harvest Strategies Policy, Practice, Strength, Weakness and Challenges and Recommendations

1.0 Introduction

Nigeria's agricultural sector faces substantial post-harvest losses that undermine food security and farmers' incomes. Nationally, 30-50% of perishable produce is lost before reaching consumers (FMARD, 2025), representing approximately ₦3.5 trillion annually (FAO, 2026). Key staples affected include cassava, rice, maize, tomatoes, and yam, reflecting systemic inefficiencies across the value chain (Adesoji & Ajileye, (2025). The World Bank (2025) reports an average cassava loss of 13%, with 96% of farmers experiencing losses from harvest to market. Post-harvest losses occur at all supply chain stages harvesting, handling, storage, processing, transportation, and marketing and manifest as quantitative (weight) or qualitative (nutritional, safety, or market quality) declines. Addressing these challenges requires modern infrastructure, storage and processing technologies, effective implementation, and institutional support to reduce waste and improve farm profitability.

1.2 Post-Harvest Volume and Current Situation in Nigeria

Improved infrastructure, technology, and effective policies are essential to reduce waste, increase farmer incomes, and enhance national food security.

Table 1: Post-Harvest Losses in Nigeria

S/No	Category	Estimated Loss Level	Description/Implication
1	Total Agricultural Produce	30-50% annually	Large proportion of food lost across value chains due to poor handling, storage, and transport
2	Perishable Produce (Fruits,	Up to 50%	Highly vulnerable to spoilage due to lack of cold storage,

	Vegetables, Tubers)		processing and preservation systems
3	Grains (e.g., maize, rice)	5-20%	Losses mainly due to pests, poor drying, and inadequate storage facilities
4	Fish and Livestock Products	20%	Spoilage due to poor processing, lack of refrigeration, and transport delays
5	Total Volume Lost	30-40 million metric tonnes annually	Significant reduction in national food availability
6	Economic Loss	₦3.5-₦5 trillion annually (2025 estimate)	Major financial loss affecting farmers, traders, and the national economy
7	Cassava (Example Crop)	13% average loss	Common staple with widespread losses during harvesting and marketing stages

Source; FAO, 2026

2.0 Institutional and Post-Harvest Policy Frameworks in Nigeria

1. National Agricultural Policy (1988; revised 2001) Strengths and Weaknesses

The National Agricultural Policy is Nigeria's first comprehensive framework for agricultural development, focusing on food security, productivity, and post-harvest management (FMIST, 2025). It emphasized reducing post-harvest losses through improved storage, processing, and preservation, aiming to enhance food availability and stabilize prices. The policy's strength lies in its integrated approach across the agricultural value chain, including production, storage, processing, marketing, and rural infrastructure, while supporting research institutions such as the Nigerian Stored Products Research Institute. The 2001 revision incorporated private sector participation and modern practices. However, its effectiveness has been limited by inadequate funding, weak coordination, poor monitoring, and insufficient storage and cold chain infrastructure. Adoption of improved post-harvest technologies by smallholders remains low due to limited awareness and access to credit, constraining the policy's overall impact.

2. Agricultural Promotion Policy (APP)/ "Green Alternative" (2016-2020): Strengths and Weaknesses

The Agricultural Promotion Policy (APP), or Green Alternative, was launched under Muhammadu Buhari to strengthen Nigeria's agricultural sector, focusing on food security, import substitution, value chain development, and post-harvest management (Ikuemonisan, 2024). Its value chain approach emphasized reducing post-harvest losses through improved storage, agro-processing, and private sector participation, while promoting investment in processing industries and modern

technologies. The policy also raised awareness of post-harvest challenges and the need for infrastructure development. However, implementation was uneven due to inadequate funding, institutional inefficiencies, and underdeveloped critical infrastructure, particularly cold chain systems and rural roads. Smallholder farmers faced limited access to finance and technology, constraining adoption of improved practices. While strategically strong, the APP's overall impact on reducing post-harvest losses was limited by persistent structural and implementation challenges.

3. National Food Security Programme (NFSP) (2008): Strengths and Weaknesses

The National Food Security Programme (NFSP), was established by the Federal Government of Nigeria to enhance food availability, accessibility, and stability (Inakefe et al., 2025). A central feature is the development of strategic grain reserves to reduce post-harvest losses and stabilize supply during scarcity. The programme also promotes improved storage, distribution systems, and post-harvest handling practices. Its strengths include buffer stock management, which minimizes losses, reduces price volatility, and supports national food security planning and crisis response. However, effectiveness is constrained by inadequate storage capacity, poor maintenance, weak logistics, limited coordination among agencies, and low private sector involvement. Moreover, NFSP focuses primarily on grains, neglecting highly perishable commodities. While foundational, structural and operational challenges limit its impact on reducing food losses.

4. Special Agro-Industrial Processing Zones (SAPZ) (2022-Present): Strengths and Weaknesses

The Special Agro-Industrial Processing Zones (SAPZ) is a key Nigerian initiative aimed at reducing post-harvest losses, promoting value addition, and driving agro-industrialization (Jesutowo & Jankowska, 2025). Supported by partners such as the African Development Bank, it establishes agro-processing hubs near production areas, minimizing spoilage and enhancing value chain efficiency. Its integrated model links farmers directly to processors, markets, and infrastructure, fostering rural industrialization, employment, and private investment. The programme also develops critical infrastructure, including roads, power, storage, and processing facilities. However, implementation is in early stages, with limited coverage, funding uncertainties, land acquisition issues, and coordination

challenges. Smallholder inclusion may be constrained without adequate support. While promising, SAPZ's long-term success depends on effective, inclusive implementation.

4. Nigerian Stored Products Research Institute (NSPRI) (Established 1954): Strengths and Weaknesses

The Nigerian Stored Products Research Institute (NSPRI), established in 1954, is a key national institution focused on post-harvest handling, storage, processing, and preservation of agricultural commodities (Kolapo & Ojo, 2026). Its mandate is to reduce post-harvest losses and improve food quality and shelf life across the value chain. NSPRI's strengths include research and innovation, resulting in improved storage technologies such as silos, drying systems, and pest control methods, as well as training for farmers, extension agents, and agro-processors. It also provides scientific support for policy development.

However, its impact is constrained by inadequate funding, low adoption of technologies by smallholders due to awareness and access barriers, and limited collaboration with the private sector. Effectiveness depends on stronger support, broader dissemination, and enhanced stakeholder engagement.

5. Federal Institute of Industrial Research (FIIRO) (1956): Strengths and Weaknesses

The Federal Institute of Industrial Research Oshodi (FIIRO), established in 1956, is a key Nigerian institution focused on industrial and agro-processing research. It helps reduce post-harvest losses by developing technologies for food processing, preservation, packaging, and value addition. FIIRO's strengths include innovation in converting agricultural raw materials into finished or semi-processed products, such as cassava flour and fruit juices, and providing training for entrepreneurs, farmers, and SMEs, promoting agro-industrial development and job creation. However, its impact is limited by inadequate funding, low adoption of technologies due to awareness and cost barriers, weak extension linkages, and underutilized private sector collaboration. FIIRO's effectiveness depends on enhanced funding, awareness, and stronger industry partnerships.

6. Cold Chain Development Initiatives in Nigeria (2010s-Present): Strengths and Weaknesses

Cold chain initiatives in Nigeria, increasingly emphasized since the 2010s, aim to reduce post-harvest losses of perishable commodities such as fruits, vegetables, dairy, and fish (Ojo et al., 2025). They involve temperature-controlled storage, transportation, and distribution systems to preserve quality from farm to market and are supported by government programmes, private investors, and development partners. Key benefits include reducing spoilage, extending shelf life, improving food availability, increasing farmers' incomes, and enhancing market access, including urban and export markets.

However, high infrastructure and maintenance costs, unreliable power, limited rural coverage, low farmer awareness, and poor road networks limit effectiveness. Scaling cold chains requires investment, reliable energy, and inclusive access for smallholders.

7. Agricultural Transformation Agenda (ATA) (2011-2015): Strengths and Weaknesses

The Agricultural Transformation Agenda (ATA), introduced under Goodluck Jonathan, aimed to shift Nigerian agriculture from subsistence to a business-driven sector, focusing on value chain development, agro-processing, and private sector participation to reduce post-harvest losses and enhance food security. Key strengths included linking production, processing, storage, and marketing, and initiatives like Staple Crop Processing Zones (SCPZs), which brought processing closer to farmers and improved value addition. ATA also promoted input distribution reforms and private investment.

However, infrastructure deficits, incomplete processing zones, weak coordination, limited farmer access to finance and technology, and policy discontinuity constrained its long-term effectiveness.

8. Nigeria Postharvest Systems Transformation Programme (NiPHaST) (2025-Present): Strengths and Weaknesses

The Nigeria Postharvest Systems Transformation Programme (NiPHaST), launched in 2025, aims to reduce post-harvest losses, improve food system efficiency, and increase farmer incomes (FAO, 2026). It strengthens post-harvest management through household storage technologies, community warehouses, cold rooms, strategic silos, and capacity building across value chains. NiPHaST's strength lies in its comprehensive, systems-based approach, promoting modern technologies, farmer training, and public–private partnerships to enhance storage, processing, and marketing. However, as a new initiative, it faces limited coverage, funding constraints, coordination challenges, and restricted smallholder access to technologies. Its success depends on sustained funding, effective implementation, and inclusive participation.

Table 2: Post-Harvest Policy Frameworks in Nigeria; Years, Strengths and Weaknesses

Policy/Programme	Year	Key Focus	Strengths	Weaknesses
National Agricultural Policy (NAP)	1988 (Rev. 2001)	Food security, storage, post-harvest management	Broad and integrated approach; supports value chain (production–marketing); promotes rural infrastructure; supports Nigerian Stored Products Research Institute	Poor implementation; inadequate funding; weak coordination; low adoption of technologies
Nigerian Stored Products Research Institute (NSPRI)	1954	Research, storage, preservation	Strong research capacity; develops storage technologies; provides training and policy support	Inadequate funding; low technology adoption; weak private sector linkage
Federal Institute of Industrial Research Oshodi (FIIRO)	1956	Agro-processing, industrial research	Strong innovation in processing technologies; supports SMEs; promotes value addition and training	Inadequate funding; low awareness/adoption; weak commercialization linkages
National Food Security Programme (NFSP)	2008	Grain reserves, food stability	Supports buffer stock; reduces price volatility; enhances food security planning	Poor storage maintenance; weak logistics; limited focus on perishables; weak coordination
Cold Chain Development Initiatives	2010s-Present	Refrigeration, perishable goods management	Reduces spoilage; extends shelf life; improves market access; creates business opportunities	High cost; unreliable power supply; limited rural coverage; low technical capacity
Agricultural Transformation Agenda (ATA)	2011-2015	Value chains, agro-processing, agribusiness	Strong value chain approach; promotes private sector participation; input reforms (e-wallet); SCPZ concept reduces losses	Infrastructure deficits; weak implementation; limited sustainability; low access to finance/technology
Agricultural Promotion Policy (APP)	2016-2020	Value chain development, storage, agro-processing	Strong value chain focus; promotes private sector investment; increases awareness of post-harvest issues	Weak infrastructure; inadequate funding; limited access to finance and technology by farmers
Special Agro-Industrial Processing Zones (SAPZ)	2022-Present	Agro-processing, value addition	Integrated value chain; promotes rural industrialization; attracts investment; improves infrastructure	Early-stage implementation; limited coverage; funding and land challenges; inclusion issues
Nigeria Postharvest Systems Transformation Programme (NiPHaST)	2025-Present	Integrated post-harvest systems, storage, PPPs	Comprehensive approach; promotes modern technologies; supports training; encourages PPPs; aligns with food security goals	Early-stage; funding constraints; coordination issues; limited farmer access to technologies

Table 3: Institutional Bodies Supporting Post-Harvest Research and Management in Nigeria

Institution	Year Established	Mandate	Key Focus Areas	Role in Post-Harvest Management
Nigerian Stored Products Research Institute (NSPRI)	1948 /1960	Post-harvest research and management	Storage, preservation, pest control, packaging	Develops storage technologies; trains farmers; reduces losses across value chains
Federal Institute of Industrial Research Oshodi (FIIRO)	1956	Industrial and agro-processing research	Food processing, value addition, preservation	Converts raw produce into shelf-stable products; supports SMEs and agro-processing
International Institute of Tropical Agriculture (IITA)	1967	Tropical agricultural research	Crop processing, storage, innovation	Develops improved post-harvest and processing techniques for key crops
Standards Organisation of Nigeria (SON)	1971	Product standardization	Packaging, storage standards	Develops standards that improve shelf life and reduce losses
National Agricultural Extension and Research Liaison Services (NAERLS)	1975	Extension and technology dissemination	Farmer training, advisory services	Transfers post-harvest technologies and best practices to farmers
National Agency for Food and Drug Administration and Control (NAFDAC)	1993	Food safety and regulation	Food quality, packaging, standards	Ensures safety and quality of processed foods; supports preservation systems
Agricultural Research Council of Nigeria (ARCN)	2006	Coordination of agricultural research	Research policy, funding, supervision	Oversees research institutes; aligns post-harvest research with national priorities

3. How Does Policy Target Post-Harvest Loss Reduction in Nigeria

Agricultural policies in Nigeria are designed to reduce post-harvest losses through a combination of infrastructure development, value chain improvement, technology adoption, and institutional support.

i. Development of Storage Infrastructure

Nigeria's agricultural policies prioritize modern storage infrastructure silos, warehouses, and cold rooms to reduce post-harvest losses (Onyeaka et al., 2021). These facilities preserve produce quality, protect against pests and contamination, and extend shelf life. Research institutions, such as NSPRI, support farmers by developing and promoting improved storage technologies, enabling better market timing and income stability.

ii. Promotion of Agro-Processing and Value Addition

Nigeria's policies promote agro-processing and value addition to reduce post-harvest losses (Osabohien et al., 2018). Converting raw produce such as cassava to flour or tomatoes to paste reduces perishability, extends shelf life, and improves marketability. Processing zones and support from institutions like NSPRI further enhance technology adoption, farmer incomes, and market access.

iii. Strengthening Cold Chain Systems

Nigeria's agricultural policies promote cold chain systems, using temperature-controlled storage and transport for perishable products (Ugoala, 2025). These systems preserve quality, safety, and freshness, slow spoilage, and extend shelf life, enhancing market value and reducing economic losses. Effective implementation depends on reliable energy, infrastructure, and support from institutions like NSPRI.

iv. Research and Technology Development

Nigeria's agricultural policies emphasize research and technology to reduce post-harvest losses. Institutions like NSPRI develop improved storage, preservation, and handling methods (UNICEF, 2020), minimizing spoilage and extending shelf life. Research also supports policymaking and capacity building, though wider adoption depends on effective dissemination, farmer training, and access to affordable technologies.

v. Farmer Training and Extension Services

Nigeria's agricultural policies prioritize farmer training and extension services to reduce post-harvest losses. Capacity-building programmes teach proper harvesting, handling, storage, and basic processing techniques. Extension agents link farmers with research institutions like NSPRI, facilitating technology transfer. Improved knowledge and skills enhance product quality, reduce losses, and increase farmer incomes.

vi. Market Access and Value Chain Linkages

Nigeria's agricultural policies promote market access and value chain linkages to reduce post-harvest losses. By connecting farmers, processors, traders, and consumers, produce moves efficiently to markets, minimizing spoilage. Access to market information and coordinated value chains, supported by institutions like NSPRI, enhances storage, processing, efficiency, and farmer incomes.

vii. Improvement of Transportation and Logistics

Nigeria's agricultural policies emphasize improved transportation and logistics to reduce post-harvest losses. Investments in rural roads and efficient transport ensure timely movement of produce, minimizing spoilage, physical damage, and costs. Enhanced connectivity between farms and markets improves product quality, reduces losses, and increases profitability for farmers and other value chain actors.

4. Key Structural and Systemic Barriers to Effective Post-Harvest Policy and Management

i. Poor Storage Infrastructure

Poor storage infrastructure is a major barrier to effective post-harvest management in Nigeria. Many smallholders rely on traditional methods that offer minimal protection, leading to significant losses. Scarce modern facilities, especially for perishable produce, combined with low adoption of improved technologies, result in reduced farmer incomes and ongoing food insecurity.

ii. Weak Cold Chain System

A weak cold chain system is a major constraint to post-harvest management in Nigeria. Underdeveloped and fragmented temperature-controlled storage and transport, compounded by unreliable electricity, high costs, and limited rural access, lead to rapid spoilage of perishable goods, reduce product quality, and restrict market opportunities for farmers.

iii. Inadequate Transportation

Inadequate transportation is a key challenge to post-harvest management in Nigeria. Poor rural roads, lack of specialized vehicles, and long transit times cause spoilage, mechanical damage, and reduced market value, particularly for perishable commodities. High transport costs further limit farmer income, highlighting the need for improved infrastructure and logistics.

iv. Limited Processing Capacity

Limited processing capacity is a major constraint to post-harvest management in Nigeria. Inadequate modern facilities, unreliable power, and outdated technology prevent timely conversion of perishable produce into value-added products, leading to spoilage. Low adoption of improved techniques further reduces income opportunities, value addition, and overall efficiency in the agricultural sector.

v. Financial Constraints

Financial constraints are a major barrier to post-harvest management in Nigeria. Limited access to credit and capital prevents farmers and agribusinesses from investing in modern storage, processing, and cold chain technologies. Reliance on traditional methods increases losses, reduces productivity, and limits adoption of innovations, highlighting the need for affordable financing and subsidies.

vi. Poor Harvesting and Handling Practices

Poor harvesting and handling practices are a major barrier to post-harvest management in Nigeria. Inappropriate harvest timing, crude tools, and inadequate packaging cause mechanical damage, spoilage, and reduced market value. Limited farmer knowledge further exacerbates losses, highlighting the need for training, improved techniques, and outreach by institutions like NSPRI.

vii. Market Access Problems

Poor market access is a major barrier to post-harvest management in Nigeria. Rural farmers face inefficient market linkages, reliance on middlemen, and limited price information, leading to delays, spoilage, and reduced income. Weak infrastructure and storage further exacerbate losses, highlighting the need for improved market systems and support from institutions like NSPRI.

viii. Policy Implementation Gaps

Policy implementation gaps are a major barrier to post-harvest management in Nigeria. Weak execution, inadequate funding, poor coordination, limited technical capacity, and inconsistent policies hinder the rollout of storage, processing, and cold chain systems. Low stakeholder engagement and limited uptake of innovations reduce effectiveness, perpetuating losses despite existing agricultural policies.

6. Recommendations to Effective Post-Harvest Policy and Management

i. Massive Investment in Infrastructure

Reducing post-harvest losses in Nigeria requires substantial investment in agricultural infrastructure, including modern storage facilities, cold chain systems, and reliable rural roads. Enhanced transportation, power supply, and processing support faster market access, minimize spoilage, strengthen value chains, promote agro-processing, and increase farmers' incomes.

ii. Strengthening Cold Chain Systems

Strengthening cold chain systems is vital to reducing post-harvest losses in Nigeria. Investments in temperature-controlled storage, refrigerated transport, mobile and solar-powered cooling solutions, and reliable energy help preserve perishable produce, extend shelf life, improve food safety, enhance market value, and increase farmer incomes while boosting overall food system efficiency.

iii. Promote Agro-Processing Industries

Promoting agro-processing industries is crucial for reducing post-harvest losses and adding value in Nigeria (Adesoji & Ajileye, 2025). Establishing processing facilities near production areas, supported by incentives, finance, and farmer-processor linkages, enables timely conversion of raw produce, extends shelf life, increases incomes, creates employment, and reduces waste, with support from institutions like NSPRI.

iv. Access to Finance

Improving access to finance is crucial for reducing post-harvest losses in Nigeria. Affordable credit, grants, and credit guarantees enable farmers and agribusinesses to invest in storage, processing, and cold chain technologies. Linking farmers to financial services and strengthening institutions supports adoption of innovations, reduces losses, and increases incomes.

v. Policy Implementation and Monitoring

Effective policy implementation and monitoring are key to reducing post-harvest losses in Nigeria. Strong execution, coordination, adequate funding, and clear institutional roles are essential. Robust M&E systems, stakeholder feedback, and collaboration with institutions like NSPRI ensure policies translate into real impact, improving food security and reducing losses.

vi. Farmer Education and Extension Services

Strengthening farmer education and extension services is vital to reducing post-harvest losses in Nigeria. Continuous training on harvesting, handling, storage, and processing, supported by extension agents and digital platforms, ensures effective technology transfer from institutions like NSPRI. Enhanced farmer capacity improves post-harvest management, reduces losses, boosts productivity, and increases incomes.

Conclusion

Post-harvest losses remain a major constraint to agriculture and food security in Nigeria. Despite policies and initiatives such as SAPZ and NiPHaST, gaps in implementation, infrastructure, funding, coordination, and technology adoption limit impact. Strengthening institutions, ensuring effective execution, and encouraging private sector participation are essential to reduce losses, boost incomes, and transform agriculture.

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