

## C248 – Nigeria Improving SPS compliance to boost export capacity project

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### REPORT ON GENDER ANALYSIS STUDY IN COWPEA VALUE CHAIN IN NIGERIA

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Photo: Retail Marketing of Cowpea

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## EXECUTIVE SUMMARY

### A. Study Purpose and Context

This study forms an integral part of the broader project, "Improving SPS compliance to boost Nigeria's export capacity," with a specific focus on the cowpea (also known as beans) value chain. It addresses a critical national challenge: the long-standing ban on Nigerian dried bean exports to the European Union and other markets due to non-compliance with Maximum Residue Limits (MRLs) for pesticides. Cowpea is a vital staple and cash crop in Nigeria; however, its value chain is constrained by severe pest pressures, resulting in the widespread and often unsafe use of synthetic pesticides during storage and production. This study uses an integrative gender analysis approach to inform and ensure that interventions aimed at improving Sanitary and Phytosanitary (SPS) compliance are inclusive and equitable. Given the distinct, gender-based roles in the cowpea chain, "gender-accommodative" approaches risk reinforcing existing inequalities and failing to address the root causes of non-compliance, such as the disconnect between those who apply chemicals and those who handle the crop post-harvest.

## **B. Methodology**

The study employed a qualitative approach centred on Benue State, a major hub for cowpea production and aggregation. The methodology included a Desk Review, which synthesized existing literature on cowpea systems, pesticide use, gender dynamics and policy and programme supports in Nigerian and regional legume value chains. Fieldwork followed, involving primary data collection in Benue State communities and markets (Ugbokolo, Otukpo, Wadata-Makurdi) through sex-disaggregated Focus Group Discussions (FGDs) with women and men farmers, processors, and traders; Key Informant Interviews (KIIs) with actors across the chain, including aggregators, agro-dealers, and extension officers. Participatory Tools: Gendered seasonal calendars, daily activity clocks, and problem-tree analysis to map labor, time use, and the systemic causes of SPS non-compliance. Data were analyzed thematically and framed using the Reach, Benefit, Empower, Transform (RBET) framework to develop actionable, gender-inclusive recommendations.

## **C. Key Findings**

### **a) Gendered Division of Labor and the Chemical Safety Paradox**

The cowpea value chain exhibits a clearly defined gender segmentation. Women dominate planting, weeding, harvesting, and all post-harvest processing activities, including shelling, winnowing, and cleaning. Men, conversely, control key productive resources and decisions, including land ownership, the purchase of inputs (especially pesticides), bulk storage, transportation, and major marketing. This division of labor creates a critical SPS risk paradox. Women are the primary handlers of the crop at the point of sale and consumption, yet they have minimal influence over the agri-chemical treatments applied in the field and during storage. Meanwhile, the men who control pesticide purchase and use are often absent from the final handling stages where compliance is ultimately determined.

### **b) Systemic Pesticide Misuse, "Double-Dosing," and the Food Safety Crisis**

Awareness of Maximum Residue Limits (MRLs), pre-harvest intervals, and safe pesticide practices are exceptionally low across the value chain. A widespread shift from traditional storage methods to a heavy reliance on toxic, often-banned chemicals such as "Gammalin 20" (Lindane) and "Nuvan" (Dichlorvos), an organophosphate classified as highly hazardous to human health, has created a severe food safety crisis. A

particularly alarming finding is the pervasive risk of "double dosing": Farmers routinely treat cowpea with chemicals at harvest, and buyers or aggregators, unaware of this prior treatment, often re-treat the same batch before and during storage or sale seeking to prevent insect damage and extend shelf-life. This leads to dangerously high and unpredictable residue levels. The continued availability and misuse of such substances have led to frequent detection of pesticide residues, including lindane, dichlorvos, and others in cowpea, resulting in several outbreaks of acute food poisoning and longer-term health risks for consumers. In this context, reliance on hazardous storage chemicals has become a common, low-cost but high-risk practice across multiple value chains, contributing to a systemic food-safety crisis that particularly threatens domestic consumers and undermines Nigeria's ability to meet stringent export standards. This problem is compounded by consumer misperception; many consumers interpret visible chemical powder or dead insects in grain as signs that a "*chemical has worked and expired*," incorrectly associating these visible signs with safety rather than danger.

### **c) Policy Environment: A Tale of Two Realities**

A Gender in Agricultural Policy (GAPo) analysis of thirteen major policy instruments reveals a stark polarization in Nigeria's policy landscape with direct implications for the cowpea value chain. These policies includes (National Food Safety and Quality Bill 2022; National Policy on Food Safety and Its Implementation Strategy 2014; Revised National Policy on Food Safety and Quality 2024, Nigerian Stored Products Research Institute (NSPRI) Food Safety Policy 2024–2030; National Policy on the Environment (Revised) 2016; Agriculture Promotion Policy (APP) 2015–2020; Economic Recovery and Growth Plan (ERGP); National Agricultural Seed Policy (NASP); Nigeria Digital Agriculture Strategy (NDAS) 2020–2030; National Agricultural Extension Policy (NAEP) 2017; National Gender Policy in Agriculture (NGPA) 2025–2030; National Food and Nutrition Policy (NFNP) 2016; and National Agricultural Technology and Innovation Plan (NATIP) 2022–2027). The food safety governance framework comprising the National Food Safety and Quality Bill (2022), the NPFSIS (2014 and 2024 revisions), and the NSPRI Food Safety Policy (2024–2030) is almost entirely gender-blind, scoring at Level 1 (zero of 32 gender indicators). These are the very instruments that govern MRL compliance, post-harvest handling standards, and SPS certification activities, which are dominated by women. The food safety system is thus structurally misaligned with the people who actually do the work it seeks to regulate. Conversely, a new generation of agricultural policies notably the National Gender Policy in Agriculture (NGPA, 2025–2030, Level 5), the National Agricultural Technology and Innovation Policy (NATIP, 2022–2027, Level 4/5), and the National Agricultural Extension Policy (NEP, 2017, Level 4) provides strong, and in the NGPA's case transformative, gender mandates. However, these policies suffer from weak implementation, under-resourced gender desks, and no sex-disaggregated monitoring data for cowpea specifically.

### **d) Barriers to Women's Participation as Compliance Agents**

Women are uniquely positioned to act as agents of change for SPS compliance, given their role as final handlers. However, their effectiveness is constrained by systemic barriers:

- **Information Access:** Men primarily access pesticide and market information from agro-dealers and radio, while women rely on informal networks, resulting in less access to accurate SPS knowledge.

- **Time Poverty and Mobility:** Women's workdays are burdened with a "double burden" of farm and domestic responsibilities. Furthermore, prevailing social norms restrict their mobility, limiting their ability to attend training sessions or engage with formal extension services.
- **Financial Exclusion:** A lack of access to capital and credit prevents women from investing in basic, safe storage and handling infrastructure, such as hermetic PICS bags and clean drying tarpaulins, even when awareness of these solutions exists<sup>1</sup>.

#### e) Enabling Factors and Demand for Safe Solutions

Despite these barriers, there is strong, enabling demand for change. The research revealed a willingness among both women and men to pay for safe, effective storage technologies such as hermetic PICS bags, primarily to avoid the health risks and costs associated with agrochemicals. Women, who typically control income from cowpea and allocate it to vital household needs such as children's education and food, are highly motivated to adopt safer practices. Trusted, face-to-face communication channels, particularly through farmers, market, religious and cooperative associations and practical, side-by-side demonstrations, were identified as the most effective pathways for disseminating SPS information and building trust in new technologies.

#### D. Conclusion and Recommendations

Achieving sustained SPS compliance in Nigeria's cowpea sector and ultimately lifting the EU export ban requires transforming its gendered power dynamics and addressing structural misalignment in the policy environment. Current practices pose significant health risks to consumers and producers alike and perpetuate non-compliance. Interventions must be deliberately gender-responsive to break the cycle of agrochemical dependency, leverage women's roles as key handlers, and ensure that the benefits of safe trade are equitably shared.

To ensure the project's interventions are effective, inclusive, and sustainable, the following actions are recommended, structured using the **Reach, Benefit, Empower, Transform (RBET)** framework.

The policy environment offers both a mandate and an advocacy opportunity. The NGPA (2025–2030) and NATIP (2022–2027) provide transformative gender provisions that this project should formally align with by embedding their core principles — mandatory gender-disaggregated data collection, dedicated budget lines for women's activities, and explicit targets for women's participation in extension, training and value chain development into the project's training curricula, monitoring frameworks, and partnership agreements. Simultaneously, the gender-blind food safety framework exemplified by the NPFSIS (2014 and its 2024 revision) and the National Food Safety and Quality Bill (2022) present a clear advocacy opportunity. The project can demonstrate through policy briefs and impact stories, how integrating gender-responsive approaches into SPS compliance training and co-designed communication resources and campaign, directly addressing critical gaps in these policies, positioning the project as a practical model for making food safety governance more inclusive.

#### REACH: Ensuring Inclusive Access to Information and Training

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<sup>1</sup> Purdue Improved Crop Storage (PICS) bags - hermetic storage - Adomi, A.A., Abdoulaye, T., Mohammed, A.B., Abdu, Z., Musa, S.A. and Baributsa, D. (2023). Impact of Improved Hermetic Storage on Food Insecurity and Poverty of Smallholder Cowpea Farmers in Northwestern Nigeria. *Journal of Stored Products Research*, 100. DOI: <http://doi.org/10.1016/j.jspr.2022.102042>.

- Co-design and deliver all SPS training through decentralized, community-level forums such as local farmers' associations and women's cooperative/market groups, using visual, low-literacy tools and local languages.
- Mandate and schedule separate training sessions for women at times that accommodate their dual burdens (e.g., mid-morning 9am to 1pm or school holidays), and hold them in accessible, community-based locations to address mobility barriers.
- **Project Action:** Leveraging the Revised National Gender Policy in Agriculture and its Strategic Action Plan (2025–2030) and the National Agricultural Extension Policy (NAEP, 2023) mandate for inclusive service delivery and gender-sensitive programming, the project can train volunteer women lead farmers as compliance advisers, risk communicators, and champions to decentralize SPS training at community level to complement State ADP efforts in Benue and Nasarawa. The NAEP explicitly calls for decentralized, demand-driven extension that ensures support for women, youth, and other underserved groups, while also promoting public-private collaboration and pluralistic service delivery. To operationalize this mandate, the project can partner with institution such as Sasakawa Africa Association (SAA) Nigeria formerly Sasakawa Global 2000—which has a long-standing track record of strengthening extension systems and conducting practical, field-tested training across multiple value chains. SAA Nigeria has implemented demonstration plots featuring improved cowpea varieties such as SAMPEA 11, with documented yield gains from 0.6 MT/ha to 2.5 MT/ha for cowpea through a combined approach of input supply, hands-on training, and field-based learning. The association also works directly with State ADPs, having, for instance, distributed plastic tables, chairs, moisture meters, and other support items to women's cooperatives and extension service delivery points in Niger State. Through this partnership, the project can focus on conducting pre-season Training-of-Trainers (ToT) programmes (SAA has recently trained 116 frontline extension agents across intervention states), and co-designing gender-sensitive training and risk communication materials, knowledge resources all aligned with the project interventions, NAEP's framework and SAA's proven farmer-centric methodology.
- The project's focus on SPS compliance directly complements the Food Safety for Africa (FS4Africa's Use Case 2 (UC2)<sup>2</sup>, a dedicated workstream actively tackling the challenge of high pesticide residues in staple crops, including cowpea. The FS4Africa is a four-year, EU-funded Horizon Europe project (2024–2027) dedicated to revolutionizing food safety systems across the continent, targeting countries such as Nigeria and Ghana in west Africa, with a particular focus on the vital yet underserved informal sector and actors. Led by a consortium of experts from Africa and Europe, the project employs an interdisciplinary, multi-actor approach to co-design, implement, test, and evaluate innovative solutions. Through a coordinated collaboration on co-designing communication materials and training resources such as 'safe cowpea' handbook, pre-recorded video and audio lessons, poster, community drama and role-play stories, that can be performed by local groups to dramatize the health and economic consequences of poor practices and

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<sup>2</sup> FS4Africa (Food Safety for Africa). (2024–2027). FS4Africa Project Fact Sheet. Horizon Europe (Grant Agreement ID: 101136916). European Commission. <https://cordis.europa.eu/project/id/101136916>

the benefits of compliance, making the message culturally resonant, the project can effectively educate farmers on pesticide Maximum Residue Limits (MRLs), raise awareness about the health and economic benefits of safe practices, and promote the adoption of Good Agricultural Practices (GAP) and alternative solutions such as hermetic storage bags. By leveraging FS4Africa's promotion of good practices, this partnership can ensure a wider reach to actors and stakeholders and a unified, impactful approach to reducing the double-dosing of pesticides observed in major cowpea-producing states in Nigeria.

- Instead of creating new structures, embed SPS training into the regular meetings of existing women's farmers groups, traders' unions, self-help groups, village savings and loan associations (VSLAs), and cooperative societies.
- Establish "Model Farms": Partner with women-led farmers and cooperatives to establish "Model Farms" that strictly follow all SPS protocols. These farms become practical laboratories for training, open for other farmers to visit and learn. On-farm processes and activities should be documented using participatory videos techniques so knowledge can be communicated to actors in other states.

By producing and deploying this mix of materials and strategies, the project can educate on SPS compliance and build a lasting, market-driven culture of food safety.

Aligned with the NEP (2017, 26/32 GAPo) and the NGPA (2025–2030, 32/32), the Reach pillar calls for routing all project outreach through women's cooperatives, farmer associations, and market women's groups, which women consistently identify as their most trusted and accessible channels. Training sessions must be women-only and scheduled at the community level during late afternoons or low-labor seasons. All materials should use simple pictorial formats in local languages (Tiv, Idoma, Hausa, Pidgin English). In northern states such as Kano, Gombe, and Borno, where cultural norms restrict women's mobility and interactions with male extension agents, the project should deploy female extension/lead farmers volunteers and phone-based outreach routed through women's group leaders as community intermediaries. Evidence from the SEEDEQUAL initiative and IFAD VCDP in Benue should be actively used to accelerate state ADP adoption of gender-responsive extension scheduling.

### **BENEFIT: Creating Equitable Incentives and Rewards**

- Develop and promote market-based incentives that reward safe practices, such as creating direct linkages between women's producer groups and buyers (including exporters) seeking verified, low-residue cowpea.
- Actively promote and facilitate access to affordable, chemical-free storage technologies (like PICS bags)
- Create a "Certified Safe Cowpea" Brand: Develop a simple, recognizable logo for bags of cowpea that meet SPS standards. This logo can be used on packaging and in the market, creating a market incentive for compliance.
- Drawing on the APP (2015–2020), the ERGP, and the NGPA (2025–2030), the Benefit pillar requires developing incentive structures that explicitly recognize and reward women's quality-critical labor in cowpea — the shelling, sorting, winnowing, and cleaning that directly determine whether cowpea meets MRL standards. A premium payment scheme for low-residue, verified cowpea open to all suppliers meeting quality standards, with targeted support to enable women's groups to participate, would serve as a valuable complementary incentive.

- Women-led aggregation should be actively supported and cooperatives linked to NEPC export channels and the FMAD/NWAPDI Sovereign AgroTrade System, whose AgriXchange, AgriCert, and NWAPDI Grow components offer pathways to quality certification and cooperative finance.
- Launch a "SPS Ambassador" Program: Train and certify respected lead farmers, aggregators, traders, especially women—as SPS Ambassadors. Provide them with a branded vest, a mobile phone loaded with resources, to conduct peer-to-peer training.
- Benefits should be tracked using indicators women prioritize: control over cowpea income, acquisition of processing or storage assets (including PICS bags), reduced drudgery and time burden, and improved access to safe storage information.

### **EMPOWER: Building Agency and Decision-Making Power**

- Deliberately integrate women into SPS decision-making processes at the farm and community levels. Provide joint training for women *and* men on safe pesticide use, specifically highlighting the severe health and economic risks of "double dosing" to build a shared understanding and shared responsibility.
- Communicate through briefs, credit challenge with financial institutions and government agricultural programmes to develop tailored financial products that support women's access to credit for purchasing safe storage solutions and small-scale processing equipment.
- **Action:** Utilize the National Gender Policy in Agriculture's (NGPA, 2025–2030) dedicated budget lines (from 2026) and its provisions on women's access to financial services to advocate for targeted grants targeting women cowpea processors and traders.
- Grounded in NATIP (2022–2027), the NASP (2022), the NFNP (2016), and the IFAD VCDP experience in Benue, the Empower pillar focuses on building women's practical agency across the cowpea value chain. Post-harvest technologies should be co-designed with women rather than selected and imposed, ensuring that tools address the drudgery points women themselves identify — manual shelling, winnowing heavy sacks, and repetitive sorting and cleaning tasks that are physically demanding and directly affect SPS outcomes.
- Selected women should be trained as lead farmers and peer educators on SPS practices, including correct use of PICS bags and the dangers of double-dosing, creating a community-embedded extension multiplier.
- Joint spousal decision-making training on input use and safe pesticide application is essential, given that men currently control pesticide purchasing while women bear the health consequences of unsafe storage. The IFAD Value Chain Development Programme (VCDP) in Benue has tested a Commodity Alliance Forum (CAF) approach connecting farmers, processors, off-takers, financiers, and government under a Public-Private-Producers Partnership (4Ps) model, offering a replicate template for the project's financial inclusion work in Benue.

### **TRANSFORM: Addressing Systemic Drivers of Inequality and Non-Compliance**

- Foster community dialogues to shift restrictive norms on women's mobility and participation in commercial nodes.
- Formally align the project's gender strategy with NGPA (2025–2030) commitments and communicate briefs on project-generated evidence on gender and food safety back to Federal Ministry of Agriculture and Food Security (FMAFS) Gender Unit to contribute to NGPA accountability and implementation reporting.
- Gender-responsive extension approaches should be institutionalized within state ADPs in Benue and Nasarawa by citing the NEP's legislative mandate.
- Traceability models should combine low-tech tools such as branded or color-coded sacks indicating “chemically treated” versus “non-chemical storage” with progressive digitalization aligned with NDAS gender provisions, preventing the double-dosing crisis by enabling buyers to identify already-treated grain.
- Pilot simple, low-tech traceability systems, such as color-coded sacks for treated versus untreated grain, to prevent re-application, build a foundation for formal traceability, and formally recognize women's role as quality gatekeepers.

The Transform pillar addresses structural and systemic drivers of women's exclusion, anchored in the NGPA (2025–2030) and the NEP (2017), with the gender-blind food safety frameworks — NPFSIS (2014, 2024) and NSPRI-FSP (2024–2030) — as explicit advocacy targets. The most powerful contribution this project can make to long-term systemic change is to generate sex-disaggregated, value-chain-specific food safety evidence on cowpea that these frameworks currently lack entirely and feed it directly into their next policy revision cycles through engagement with NAFDAC, NSPRI, and FMAFS. This project should formally align its gender strategy with the NGPA (2025–2030), documenting how each activity contributes to its implementation at national, state, and community levels.

## 1.0 BACKGROUND

### 1.1 Study Rationale and Link to Project Goals

Cowpea (*Vigna unguiculata*) is a major staple in Nigeria, providing affordable plant-based protein, micronutrients and income for millions of rural and urban households (5, 9). Nigeria is one of the world's largest producers and consumers of cowpea, with significant production zones in the northern states and the Middle Belt. States such as Benue serve as key production and aggregation hubs, supplying large volumes of processed products to southern and interstate markets (5, 5,16).

Despite its importance, the cowpea value chain, encompassing production and marketing, is hindered by severe pest pressure in the field and during storage, leading to both quantitative and qualitative losses (5,11). To mitigate these losses, farmers, traders, and aggregators apply synthetic pesticides at multiple points along the chain, including pre-harvest spraying, field pest control, drying, storage fumigation, and re-treatment before sale (10, 12). Studies from Nigeria and the wider West African region reveal a widespread reliance on organophosphates and other hazardous plant protection products (PPPs), often without adequate adherence to label instructions or knowledge of maximum residue limits (MRLs) (6, 10, 12, 14, 17).

Monitoring of cowpea and other stored grains in Nigerian markets has repeatedly detected residues exceeding World Health Organization and European Union (EU) limits in some locations, indicating unsafe application practices and raising serious food safety concerns (6, 10, 14). At the same time, recent residue surveys from selected producing states indicate that, when improved practices are adopted, residues can be kept within EU MRLs, suggesting the potential of targeted SPS-focused interventions and systematic monitoring (17).

These patterns contributed to domestic safety concerns and international trade restrictions, most notably the long-standing EU ban on dried beans from Nigeria due to non-compliant pesticide residues. Analyses of PPP use along the cowpea chain highlight gaps in farmer awareness, the limited effectiveness of regulatory influence, and the absence of traceability and residue surveillance systems (12). The project "Improving SPS compliance to boost Nigeria's export capacity" was therefore designed to: reduce and support residue monitoring and traceability to rebuild market confidence, establish MRL standards, and facilitate the lifting of export restrictions; collaborate with and sensitize women and men value-chain actors and relevant stakeholders on SPS requirements and safer pest management; and strengthen capacity for safer production, post-harvest handling and storage (12, 17).

Evidence from Nigeria and other African countries shows that gender roles are evident throughout the cowpea value chain, with men often controlling land, finance, and production resources and decisions, including pesticide purchase and application, while women contribute labor in weeding, harvesting, processing, storage, and retail trade, and often manage small-scale processing and the sale of cooked or processed cowpea products (1, 2, 4, 7, 8, 19). Women generally have restricted access to extension services, agronomic crop management, improved processing and storage technologies (e.g., PICS bags), finance, and market information, and have less agency within the value chain and in household decision-making (2, 7, 19).

For instance, in Kano State, adult men dominate most on-farm cowpea activities, such as land preparation, planting, weeding, fertilizer and pesticide application, and varietal selection, while adult women are primarily responsible for processing and many income-generating activities based on processed cowpea products (4). Similar patterns of gendered division of labor and unequal access to resources and information are documented in cowpea and legume chains across West, East and Southern Africa (1, 2, 7, 8, 19). Women are often concentrated in lower-return segments and face structural barriers, mobility restrictions, time burdens, limited education and fewer extension contacts, which constrain participation in higher-value or more formalized nodes of the chain (2, 3, 7, 18, 19).

Evidence on agricultural and food value chains shows that when gender inequalities are not explicitly addressed, inclusive interventions can inadvertently reinforce existing disparities or shift risks and workloads onto women (2, 3, 13, 18). Conversely, mainstreaming gender through participatory, gender-sensitive diagnostics, sex-disaggregated targeting and design, and attention to women's control over assets and decision-making is associated with improved household incomes, better enterprise performance and more equitable value-chain upgrading, although gains for women are heterogeneous (3, 13,18).

In the cowpea chain, gender-responsive research and breeding initiatives show that when women's and men's trait preferences, roles and constraints are incorporated into varietal design, extension and market strategies,

adoption of improved technologies and varieties increases and benefits are more widely shared (1,6,8). Yet few studies systematically connect gender dynamics with pesticide use, SPS awareness, traceability and export-oriented compliance across an entire national cowpea chain. To avoid designing interventions that unintentionally exacerbate gender inequalities, a gender analysis and value chain development of cowpea in Nigeria were conducted as core analytical activities within the broader project.

## 1.2 Introduction

Cowpea occupies a central place in Nigeria's food systems, serving as a major source of dietary protein and micronutrients for low-income households and as an important cash crop for smallholders, traders and processors (5, 9). Demand for cowpea grain and products remains high in both rural and urban markets, and value-added forms (boiled cowpea, fritters, pancakes, leaves, fodder) offer diverse livelihood opportunities, particularly for women processors and retailers (8,19).

In Nigeria, Benue State is a significant cowpea belt within the Guinea savannah/Middle Belt, characterized by favourable rainfall, soils, and market connectivity. Studies of cowpea and other legumes in central Nigeria highlight Benue and neighbouring states, such as Nasarawa, as major suppliers of cowpea and processed products to southern urban markets, including Lagos and Port Harcourt, through established trader networks and aggregation points (5, 16). Technical efficiency analyses indicate that cowpea producers in Nasarawa State operate under mixed production systems, with scope for efficiency gains through improved agronomic and post-harvest practices, suggesting similar opportunities and constraints in Benue's smallholder-dominated systems (16).

Market-oriented chains in West Africa demonstrate that cowpea's value extends beyond grain to include leaves, fodder and a wide range of processed products, with women dominating processing and retail segments (19). In Mali, for example, processor-retailers of boiled cowpea and fritters achieve higher gross margins than grain traders, despite operating on smaller volumes, and women are highly represented in these value-adding roles (19). Nigerian evidence corroborates these patterns, with women largely engaged in processing and retail, while men commonly act as bulk traders and aggregators (4, 9). Benue's role as an aggregation hub connecting surplus-producing northern and Middle Belt zones with urban markets in the south positions as a strategic site for examining how these gendered roles manifest in a context that is both production- and trade-intensive.

At the same time, cowpea value chains in Benue are embedded in national SPS challenges related to pesticide use, residues, and export compliance. Evidence from Plateau and other North-Central states shows high reliance on hazardous pesticides for storage, and in some locations, residues in marketed cowpeas exceed international limits, reflecting unsafe practices and weak enforcement (6,10, 14). National residue surveys indicate that where improved integrated pest management (IPM) and better storage practices are adopted, cowpeas entering trade channels can meet EU MRLs, but such improvements remain uneven across states and market segments (12, 17). As a major source of cowpea for inter-state trade, Benue is therefore central to any effort to strengthen SPS compliance along Nigeria's cowpea value chain.

Gendered analyses from other Nigerian States and African contexts provide important comparative insights. Across Northern Nigeria, adoption of improved storage technologies, such as PICS bags, is influenced by gender-differentiated access to extension, information, and financial resources, with women often at a disadvantage (7). In Malawi, Mozambique, and Tanzania, women are major producers of cowpea but face constraints on land access, market participation, and influence over breeding priorities, which, in turn, affect the adoption of improved varieties (1, 2). These patterns suggest that in Benue, where cowpea is both a production and a trade commodity, gender dynamics will shape who can respond to SPS-related demands (e.g. changes in pesticide use, quality standards) and who captures benefits from compliance and market upgrading.

Evidence beyond cowpea reinforces the importance of gender-responsive value-chain development. Systematic reviews and cross-crop case studies indicate that integrating gender analysis and targeted strategies across interventions is associated with higher household incomes, better enterprise performance and inclusive upgrading, though impacts on women's empowerment remain contingent on addressing underlying norms and power relations (3, 13, 18). Inclusive innovation frameworks in breeding and value-chain design stress that without gender analysis, interventions risk "missing the mark" on their impacts on smallholder women and men (11, 15, 18).

### 1.3 Study Objective

Within the broader project, the gender analysis and value chain development of cowpea in Nigeria has been designed to: provide analysis of gender roles, responsibilities and decision-making along the cowpea chain; examine how women and men access and use information related to SPS requirements, pesticide regulations and market expectations; explore gender-differentiated access to traceability and certification mechanisms; identify preferred informational dissemination channel, identify perceived benefits and aspiration, gender-specific barriers and enabling factors for participation in SPS-compliant value chains; and generate actionable recommendations linking SPS technical goals with gender-equitable livelihood benefit outcomes. Although primary fieldwork is anchored in Benue, the study is framed to inform SPS project interventions across multiple Nigerian cowpea hubs, drawing on national and regional literature for comparison and extrapolation (1, 2, 4, 7, 8, 10, 12, 16).

## 2.0 METHODOLOGY

The study applied a qualitative, gender value-chain analysis, integrating desk-based review with fieldwork in Benue State. The approach aligns with recent gendered cowpea and legume value-chain studies that combine literature review, value-chain mapping, key informant interviews (KIIs) and sex-segregated focus group discussions (FGDs) (1, 2, 7, 8, 19).

### 2.1 Desk-Based Review

Desk Research was used to situate the study within the broader Nigerian and regional context and to inform the development of field tools and participant sampling. It reviewed cowpea production systems and constraints in Nigeria and the region (5, 11, 16), pesticide use and residues (6, 10, 12, 14, 17), gendered participation and constraints in legume value chains (1, 2, 4, 6, 7, 8, 19), and evidence on gender-responsive value-chain interventions (3, 13, 18) and policy support.

This synthesis informed:

1. The focus of field inquiry and the framing of questions on cowpea in Nigeria (e.g. pesticide-related roles, SPS awareness, challenges and opportunities).
2. The adaptation of participatory tools (e.g. gender-sensitive value-chain analysis, daily activity clocks, and problem tree analysis) to the cowpea/SPS context.

### 2.2 Study Locations and Sampling

In Nigeria, Benue State was purposively selected as the primary field site because it is a major cowpea production and aggregation hub in the Middle Belt, serving northern and southern markets (5, 16). Benue's agro-ecological conditions (Guinea savannah), established cowpea production systems, and strategic market linkages to southern consumption centres make it representative of the emerging commercial cowpea corridor in central Nigeria (5, 16). Its role as a crossroads between production and consumer regions also means that SPS-related practices adopted in Benue, particularly those related to pesticide use, storage, and quality control, are likely to influence the safety and reputation of cowpea supplied to multiple states in Nigeria.

In addition, Benue has been a focal area for broader legume research and development efforts in the Middle Belt, highlighting both productivity potential and persistent inefficiencies in input use, pest management, and market access (11, 16). Locating the gender study in Benue serves two purposes:

1. It allows analysis of gender dynamics in a context where cowpea is both an important smallholder crop and a key traded commodity with SPS relevance.
2. It provides a strategic pilot site whose lessons can inform the adaptation of SPS-compliance and gender-responsive strategies in other cowpea-producing states, while acknowledging contextual variation.

Rural communities and markets were selected to reflect the value chain's production, processing, and trade functions:

1. Communities: Ugbokolo (in Okpokwu LGA) and intensive cowpea cultivation, processing, and aggregation zones.

2. Markets: Ugbokolo market (Okpokwu LGA) – local aggregation and retail market; Otukpo market (Otukpo LGA) – major wholesale and retail node; Wadata market, Makurdi – large urban market with regional inflows and outflows.

Expert consultations with a cowpea researcher, state-level extension staff, and lead farmers helped identify active cowpea LGAs, communities, markets, agro-dealers, and aggregators representing different segments of the value chain. While other major cowpea-producing states (e.g. Kano, Kaduna, Niger, Gombe) were incorporated via the literature (4, 7, 10, 12, 16), primary data collection was conducted in Benue.

A multi-stage purposive sampling strategy was used to capture diversity of roles and experiences while ensuring sex-disaggregation. Focus Group Discussions (FGDs) – four sex-segregated groups:

1. Women farmers/processors (Ugbokolo community).

2. Men farmers/processors (Ugbokolo community).

3. Women traders (Ugbokolo market square).

4. Men traders (Wadata market, Makurdi).

Key Informant Interviews (KIIs) targeted:

5. Community leaders (Otukpo).

6. Leaders of farmers and processors associations (Ugbokolo).

7. Traders, aggregators, and market coordinators (Ugbokolo, Otukpo, and Makurdi).

8. Extension officers and relevant public-sector actors (Otukpo and Makurdi).

A deliberate effort was made to include women in KII categories where they exist (e.g., women trader leaders, women aggregation leaders, or farmers/processors leaders). Phone interviews were conducted with key actors outside the immediate field sites, thereby extending geographic coverage.

### 2.3 Data Collection Instruments

Validated gender-sensitive qualitative tools were adapted to the cowpea study context.

#### 1. Gender-Sensitive Value Chain Analysis (GSVCA)

- Used in KIIs and FGDs to map the cowpea chain from input supply to markets.
- Documented who (by gender) performs which tasks and controls which resources at each node.
- Emphasized tasks directly relevant to SPS and pesticide use (e.g. spraying, drying locations, storage choices, packaging, wholesaling).

#### 2. Seasonal Calendar

- Developed with FGD participants to map seasonal patterns of production, labor peaks, pest pressure, pesticide application, drying, storage, marketing, and training availability.
- Helped identify SPS-critical periods (e.g. timing of the last pesticide application before harvest) and women and men's seasonal labor burdens, informing recommendations on the timing of SPS interventions (25, 26, 27).

3. Gendered Daily Activity Clock (24-Hour Analysis): Used in sex-segregated FGDs to document a typical day for women and men during peak and off-peak seasons, including productive, domestic and community tasks.

- Highlighted time poverty, mobility constraints and caregiving responsibilities that affect the ability to attend training, engage with extension, or adopt labor- or information-intensive practices (25, 26, 27).

#### 4. Problem-Tree Analysis

- Facilitated with FGD groups to identify root causes, immediate causes and effects of key challenges (e.g. SPS non-compliance, pesticide misuse, low prices, exclusion from training) from women's and men's perspectives.
- Assisted participants articulate linkages between structural gender constraints (e.g. land rights, norms, education) and observed outcomes (e.g. unsafe pesticide use, limited adoption of improved storage, and market exclusion).

**KIIs** used semi-structured guides tailored to respondent type (farmer, trader, aggregator, agro-input trader, extension officer), covering:

- Observed gender roles in cowpea production, storage, trade and SPS-related processes.
- Pest and disease pressures and current management.
- Awareness of SPS requirements, national regulations and export-market expectations.
- Experience with inspections, residue testing, traceability or certification.
- Institutional support, policy implementation and perceived gaps.

**FGDs** combined open-ended discussion with participatory tools (activity clocks, seasonal calendars, problem trees, value-chain mapping), enabling participants to analyze collectively:

- Division of labour and decision-making across the value chain.
- Access to, and control over, resources and information.
- Patterns of pesticide application and exposure by gender.
- Awareness and interpretations of SPS and market requirements.
- Perceived benefits and aspirations related to cowpea livelihoods.
- Barriers and opportunities for more meaningful involvement in SPS-compliant activities.

FGDs with women were strategically scheduled in safe spaces at times and locations that did not conflict with their domestic schedules or events such as religious programmes, prayer times, market days, or burial events. Interactive summarizing at the end of FGDs and selective feedback to key informants were used as an informal member check for the accuracy of interpretations and to support participants' reflection and learning. Appreciation for participants was shown through the provision of refreshments and souvenirs, such as relevant household items.

## 2.4 Data Management and Analysis

All qualitative data (notes, audio recordings, visual outputs, and photos) were organized into folders. Audio recordings were transcribed, and field notes were expanded after interviews and FGDs to capture contextual details. A thematic analysis was conducted, guided by a gender lens (2, 3, 8, 19). Coding domains included:

- Gendered task profiles and activity calendars.
- Access to extension, training, technologies and markets.
- Pesticide use, practice and perceived risks.
- SPS awareness and interactions with regulatory or buyer requirements.
- Perceived constraints and enabling factors for women, men actors.
- Aspirations and definitions of "benefits" from cowpea engagement.

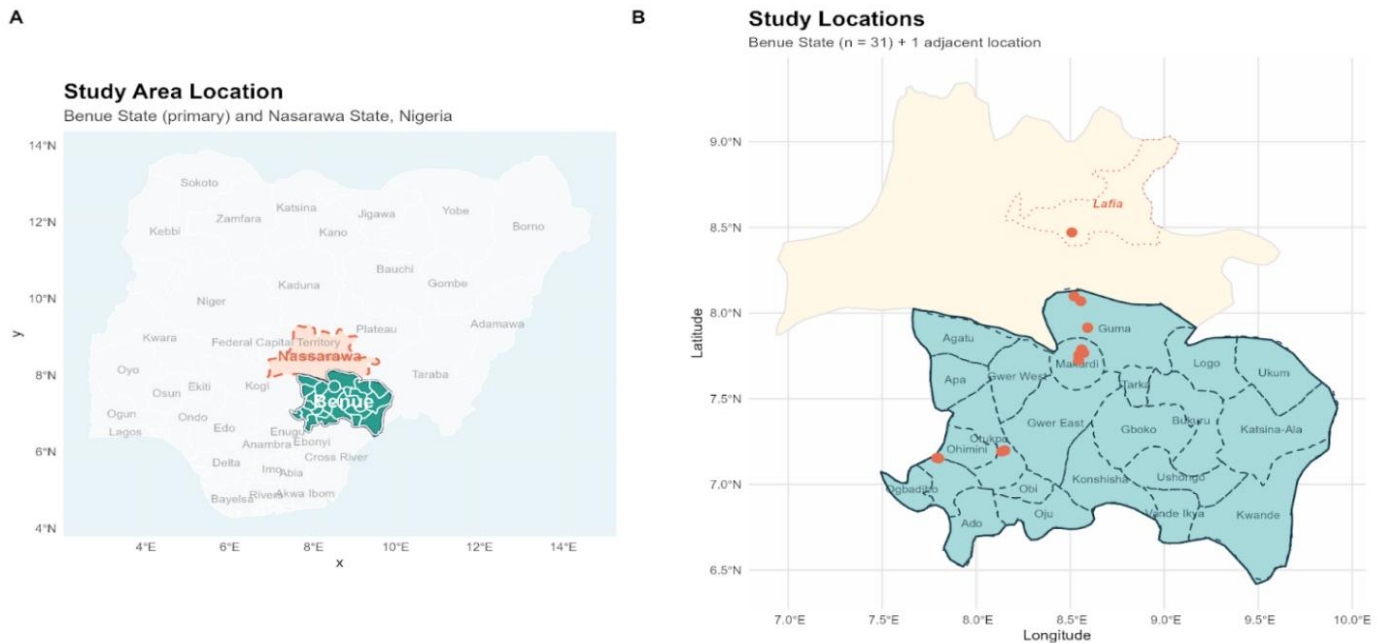


Figure 1: Map of Nigeria showing study states and locations of Key informant Interviews and Focus Group Discussion

## 2.5 List of Participants

Table 1 - Cowpea value chain stakeholders engaged in Ugbokolo-Okpokwu, Otukpo and Makurdi local government areas in Benue State

	Type of stakeholder/participant (organizations, farmers, exporters, etc.)	(Ugbokolo communities, Otukpo and Wadata markets) Number of participants		Comment
		Women	Men	
1	FGDs with Farmers/processors-Only	8	11	
2	FGDs with Local traders/aggregators	13	14	Conducted in Ugbokolo Market Square with women and in Wadata Market in Makurdi with men
3	KIIs for farmer /processor	1	1	
4	KII Community leader		1	Chief of Otukpo
5	KII Market coordinators		2	Cowpea - Otukpo
6	KII extension officers		1	Extension Officer Otukpo
7	KII Cowpea International Breeding Trials Manager	1		
	Total	23 (15 are above Age 35, 6 are between 25-35years, and two are below 24)	30 (17 are above Age 35, 13 are between 25-35years)	

### 3.0 KEY FINDINGS

#### 3.1 Regional Cowpea Production Patterns, Value Chain Activities, Institutional Support and Initiatives in Nigeria: Desk-Review Analysis

Cowpea production in Nigeria is geographically dispersed, with cultivation across multiple agro-ecological zones. Nwagboso et al. (2024) document that cowpea plays a pivotal role in supporting stakeholders across the value chain, including producers, processors, traders, and food vendors, making it a crucial multipurpose crop for households and communities nationwide. The crop's importance stems from its substantial contributions to food security, nutrition, and revenue generation across all producing regions.

Ragasa et al. (2024), a comprehensive analysis of cowpea seed systems in northern Nigeria, highlights that cowpea production faces major bottlenecks at different stages of the seed value chain. The study, drawing on Living Standards Measurement Survey data from 2015 to 2018, reveals that at the national level, the adoption rate of improved varieties was only 6 per cent of the cowpea area, with just 3 per cent of cowpea farmers reporting the use of certified seed for improved varieties. More recent household survey data from 2022 in Bauchi and Kaduna states, where cowpea production is relatively high, show that the adoption rate of quality seeds of improved varieties reached 10% of the cowpea land area.

The north-western zone is a cowpea production corridor with distinctive characteristics. In Kano State, part of the major cowpea production belt, pest infestation has been particularly acute. The devastating impact of *Maruca vitrata*, also known as the pod borer insect, has historically destroyed over 70 per cent of cowpea pods in the field (Tribune Online, 2025-35). This pest pressure has driven the development and deployment of Pod Borer Resistant (PBR) cowpea, a genetically engineered variety that resists the Maruca pod borer, developed by a team of scientists led by Professor Mohammed Ishiyaku at the Institute of Agricultural Research (IAR), Zaria (35). Idowu et al. (2010) analyzed the impacts of climate change on cowpea productivity across 20 major producing states. The study, covering the period 1961–2006, found negative correlations between rainfall and cowpea yield in Adamawa, Bauchi, Kaduna, Katsina, Kwara, Niger Plateau, and Yobe, indicating the sensitivity of cowpea production to climatic variables in these regions. Jigawa State features historical production data, with Idowu et al. (2010) noting that time trends for cowpea yield were non-significant though positive in Adamawa, Bauchi, and Jigawa, suggesting that these states have faced particular challenges in achieving productivity gains over time despite overall positive trends elsewhere.

The north-central zone, particularly Benue and Nasarawa States, serves as a cowpea production and aggregation hub connecting surplus-producing northern zones with urban markets in the south. Niger State has emerged as a strategic focal point for cowpea development through a significant partnership between the state government and the African Agricultural Technology Foundation (AATF)<sup>3</sup>. In April 2024, the African Agricultural Technology Foundation (AATF) initiated a strategic partnership with the Niger State Government to address the shortfall of over 500,000 metric tons of cowpea nationwide (AATF, 2024 - 28). Governor Mohammed Umaru Bago pledged to allocate 20,000 hectares of land exclusively to the production of Pod Borer Resistant cowpea seed, aiming to alleviate the deficit of 5 million metric tons in cowpea production and reduce import dependency on countries such as Niger and Burkina Faso (28).

Nasarawa State has gained prominence through the success stories of out-growers for seed companies who has been exporting cowpea since October 2024 to buyers in the United Kingdom and the United States (35). These outgrowers experience demonstrates the transformative potential of improved varieties: where local varieties yielded 3–4 bags per hectare with 60–70 percent pod loss to insects despite spraying 7 or 8 times, the improved

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<sup>3</sup> [African Agricultural Technology Foundation](https://www.aatf-africa.org/). It is a not-for-profit, African-led organization headquartered in Kenya, established in 2003 to improve food security and agricultural productivity in Sub-Saharan Africa. AATF facilitates the transfer of agricultural technologies to smallholder farmers to combat challenges like climate stress and pests. <https://www.aatf-africa.org/>.

cowpea varieties yield 19 to 22 bags per hectare with spraying only once every 15 days. The export opportunity has been catalytic, fetching double the local market price due to the purity and quality of the produce (35).

Cowpea production in southern Nigeria, particularly in Oyo and Ondo States, differs markedly from that in northern zones. Saka et al. (2018) conducted a comprehensive farm survey of 120 farmers selected through multi-stage sampling in Ondo and Oyo States of Southwest Nigeria, providing detailed insights into production systems in this region. The study revealed that cowpea production in Southwest Nigeria is male-dominated, with 20 percent of cultivated area allocated to it, averaging 0.96 hectares per farm household, and fragmented across approximately three locations. Local varieties were cultivated by 51.6 percent of farmers, with seeds sourced mainly from local markets (62 percent). Cowpea was primarily cultivated as an intercrop (55 percent), notably with cassava, a cropping pattern distinct from the sole-cropping systems more common in northern zones. Herbicides and insecticides were used by farmers in the southwest, while fertilizer was hardly used for cowpea production (only 12.8 percent of farmers). The average yield of cowpea on farmers' fields was 530 kg per hectare, below potential yields, with inadequate access to quality seeds, field insect pests, and rodents (storage pests) identified as the most severe production constraints. The study also noted that reductions in supplies from northern Nigeria due to insurgency had led to sharp increases in cowpea prices, especially in Southwest Nigeria, where cowpea is used in various delicacies. This underscores the interconnection of regional production systems and the importance of developing sustainable production, post-harvest and storage practices in southwest agro-ecologies.

### 3.2 Regional Production Comparison across Major Producing States in Nigeria

Table 2 below ranks the 12 most significant cowpea-producing states by estimated output volume, drawing on National Agricultural Extension and Research Liaison Services (NAERLS) Agricultural Performance Surveys (2019–2021), International Institute of Tropical Agriculture (IITA) and Consultative Group on International Agricultural Research (CGIAR) research<sup>4</sup>, and peer-reviewed literature. Nigeria accounts for approximately 58% of global cowpea production, and the bulk of output, around 79%, originates from the Sudan-Sahel and Guinea savanna zones of the North and North-Central regions. The project field mission covered the states indicated.

Key findings from the comparative data show that Borno, Zamfara and Yobe dominate overall volume, reflecting the crop's strong fit with drier Sudan-Sahel conditions. Yobe records the highest national yield (up to 2.08 t/ha, NAERLS 2021), suggesting that even under extremely dry conditions, cowpea can outperform wetter zones with higher pest pressure. Kano's Dawanau market is the largest cowpea trading hub in West Africa and serves as the critical aggregation and export gateway for the entire north. Benue, one of the field mission states, stands out for the highest recorded yield figures (up to 1.55 t/ha in some studies) and for notably stronger women's participation across all stages of the value chain, compared with northern states, where women's roles are more concentrated in post-harvest processing and household-level trade. The contrast between Borno/Zamfara (high volume, low yield, conflict-affected, male-dominated production) and Benue/Nassarawa (moderate volume, higher yield, higher women's participation) is analytically important for designing differentiated gender and productivity interventions.

**Table 2. Comparative Overview of Cowpea Production across Major Producing States, Nigeria (est. 2019–2022)**

Rank	State	Agro-Ecological Zone	Est. Area Harvested (ha)	Est. Production (MT)	Avg. Yield (t/ha)	Primary Cropping System	VC Role	Key Characteristics & Gender Notes
1	Borno	NE / Sudan-Sahel	~650,000	~520,000	~0.80	Intercrop + sole	Food security/export	Largest producer by volume; Maiduguri is a major trading hub; women dominate threshing, processing & retail; conflict disrupts supply chains in NE

<sup>4</sup> International Institute of Tropical Agriculture, a member of the CGIAR consortium (formerly the Consultative Group on International Agricultural Research). It is a non-profit, Africa-based research-for-development (R4D) organization established in 1967, focusing on improving food security, reducing poverty, and enhancing livelihoods through agricultural innovation. [www.iita.org](http://www.iita.org)

2	Zamfara	NW / Sudan-Guinea	~500,000	~400,000	~0.80	Intercrop with cotton/millet	Food security / domestic	High area allocation; intercropped with cotton; women's cooperatives active in processing & dried leaf trade; insecurity affects northern LGAs
3	Yobe	NE / Sudan-Sahel	~450,000	~400,000 (yield 2.08 t/ha top-ranked)	~2.08	Sole + intercrop	Food security / export	Highest yield per hectare nationally (NAERLS 2021); Potiskum LGA key market; women manage household cowpea stocks and home processing
4	Kano	NW / Guinea Savanna	~420,000	~330,000	~0.79	Intercrop with cereals	Food security / trade hub	Home of Dawanau — largest cowpea market in West Africa; aggregation & export role critical; women prominent in retail & processed products (Akara, Moin-moin)
5	Gombe	NE / Guinea Savanna	~380,000	~290,000	~0.76	Intercrop + sole	Food security / domestic	NAERLS 2021 ranks Gombe among highest output states; women's processing groups common
6	Adama wa	NE / Guinea Savanna	~340,000	~260,000	~0.76	Intercrop with cereals	Food security / domestic	IITA Feed the Future activity targeted; high post-harvest losses; women handle sorting, sun-drying & market sales
7	Katsina	NW / Sudan-Guinea	~320,000	~240,000	~0.75	Intercrop with groundnuts	Food security / domestic	Significant area; cowpea intercropped with groundnuts; women's groups active in value-added processing
8	Kaduna	NC / Guinea Savanna	~300,000	~240,000	~0.80	Intercrop + sole	Food security / export	One of highest yield states; central to NC production zone; women play key role in drying and market trade; Dawanau market source area
9	<b>Benue</b> ★	NC / Derived & Guinea	~280,000	~240,000	~0.85–1.55 (highest yield historically)	Intercrop with cereals	Food & nutrition security	Highest historical yield recorded (up to 1.55 t/ha); women prominent in all VC stages; field mission conducted

10	Sokoto	NW / Sahel	~260,000	~190,000	~0.73	Intercrop with millet	Food security / domestic	Hottest cowpea-producing state (34.3°C avg); heat-tolerant varieties important; women handle processing & domestic sales
11	Kebbi	NW / Sudan-Guinea	~200,000	~140,000	~0.70	Intercrop + sole	Food security / domestic	Fadama farming supports cowpea production; women active in rural markets
12	<b>Nassarawa ★</b>	NC / Guinea Savanna	~180,000	~150,000	~0.83 (high yield per NAERLS)	Intercrop + sole	Food & nutrition security	High yield rank (3rd nationally per some surveys); women's groups active in processing; field mission conducted ★

Sources: NAERLS Agricultural Performance Surveys (2019–2021); IITA Guide to Cowpea Production in Northern Nigeria (2020); CGSpace / CGIAR Economic Importance of Cowpea in Nigeria; Omoigui et al. (2020); peer-reviewed literature on climate change impacts on cowpea in Nigeria.

Notes: Production and area figures are estimates synthesised from multiple secondary sources reflecting recent cropping seasons (2019–2022). Yield figures vary by source and season. NC = North-Central; NW = North-West; NE = North-East. ★ = states covered by field mission. Yellow rank shading = top 3 by estimated volume. Yobe ranks highest nationally in yield per hectare (NAERLS 2021 data).

### 3.3 Policy and Programme Review: Support to the Cowpea Value Chain in Nigeria

Cowpea occupies a dual position in Nigeria's agricultural policy: it is both a food security crop (providing affordable protein to millions of low-income households, particularly in northern Nigeria) and a high-value export commodity with significant potential in West African and European markets. This dual role creates a policy tension, as food security priorities tend to focus on domestic availability and low prices, while export promotion requires quality standards and contract farming arrangements that can displace smallholder and women producers.

Key cowpea-specific policy and programme observations include:

- **Agriculture Promotion Policy (APP) 2016–2020 dual prioritization of cowpea:** The APP (2016–2020) explicitly selected cowpea for nutritional value and export potential, one of only a handful of crops receiving dual prioritization. However, the budget allocated to cowpea under the APP was among the lowest of the priority crops, and the value chain received limited processing and market infrastructure investment.
- **IITA-led Tropical Legume III (TL III) and its gender limitations:** The IITA-led Tropical Legume III (TL III) project (2012–2019) was the most significant cowpea-specific intervention, designed to strengthen breeding capacity, develop better seed varieties, and improve seed delivery systems for four major grain legumes: cowpea, groundnut, common bean, and chickpea. The project developed improved varieties (including drought-tolerant, early-maturing, and pest-resistant lines), established seed innovation platforms in Benue, Nasarawa, Kaduna, and Kano, and trained ADP extension staff. Women's land tenure and mobility constraints were identified as barriers but were not fully addressed through a dedicated gender action plan within TL III<sup>5</sup>.
- **Seed Equal: Equal access and improved choice (SEDEQUAL) initiative— a direct model for this project:** The SEDEQUAL initiative (IITA / NEPC, 2022–2024) is the most recent and most explicitly gender-targeted cowpea programme in Nigeria. It trained 650 female farmers in cowpea and soybean seed production in Benue and Jigawa states, introduced improved planters to reduce women's labour

<sup>5</sup> IITA-led Tropical Legume III (TL III) refers to the third phase of a project titled "Improving livelihoods for smallholder farmers: Enhanced grain legume productivity and production in Sub-Saharan Africa and South Asia".

burden, and achieved a 20% yield increase among female participants in 2024. This provides both proof-of-concept and a direct partnership opportunity for the project<sup>6</sup>.

- **European Union (EU) pesticide residue regulations and gender:** The EU has restricted cowpea imports from Nigeria due to pesticide residue non-compliance. This regulatory barrier disproportionately affects women processors and traders who handle cowpea sorting, grading, and packaging, as quality non-compliance originates partly in handling practices, but the awareness and training response has been directed almost entirely at male producers and aggregators.

### 3.3.1 Gender Dimensions of Extension Services for Cowpea

Women's roles in the cowpea value chain are more extensive and more visible than in sesame, yet their access to extension, technical training, and financial support remains equally and in some northern states, more severely constrained. The following structural dimensions are documented across both field mission and desk research states:

- **Processing labor and retail dominance:** Women form the majority of cowpea processing labor across all producing states: threshing, winnowing, sorting, parboiling, sun-drying, and packaging are all predominantly female activities. In Kano (Dawanau market) and Borno (Maiduguri), women dominate retail trade in processed cowpea products (akara, moin-moin, cowpea flour). Yet extension services focus almost entirely on production-stage support delivered to male producers.
- **Benue: more equitable participation:** In Benue, women participate more broadly across value chain stages than in northern states — including in harvesting, threshing, local sales, and household nutrition decisions. Women's groups in Benue are relatively well organized and church-based, or community savings groups provide a ready entry point for project engagement.
- **Conflict-affected northern states:** In Borno, Zamfara, and Yobe, conflict-related displacement has disrupted women's traditional roles. Displaced women are often the primary income earners yet face greater barriers to accessing inputs and extension. In conflict-affected LGAs in Borno, women's cowpea production has contracted despite need; displaced women's groups in IDP settlements represent an important target group.
- **Labor-saving technology as a gender entry point:** The IITA SEEDEQUAL project documented that female cowpea farmers were often discouraged from production-stage activities due to labor shortages at planting. The introduction of mechanical cowpea planters directly addressed this constraint and increased women's confidence and production ambition — a replicable lesson for this project.
- **Differentiated variety preferences:** Women's participation in cowpea decision-making, including variety selection and planting dates, is limited. Variety preferences differ between men and women: women often prefer dual-purpose varieties (grain and leaf) for household nutrition, while men prioritize high-yield grain varieties for sale. Extension and support services do not routinely capture or respond to this differentiated demand.

### 3.3.2 Regional Differentiation in Gender Roles: Middle Belt vs. Northern States

**Middle Belt (Benue, Nasarawa, Kaduna southern):** Women are active in planting, harvesting, threshing, and local market sales. Benue historically records among the highest yield figures nationally (up to 1.55 t/ha in some studies), suggesting that women's labor intensity contributes to better agronomic management. Women's cooperatives and savings groups are active. Nasarawa women's groups have been engaged by IITA through TL III platforms. Extension agents (male and female) can interact directly with women farmers.

**Northern States (Kano, Zamfara, Yobe, Borno, Gombe):** Women's direct field participation is culturally restricted in many areas. Women's cowpea activities are concentrated within the household compound (processing, storage, retail from home) and in female-dominated market sections. Kano's Dawanau market has female traders in large numbers, but they are rarely reached by formal extension. In Yobe and Borno, conflict and displacement add

<sup>6</sup> **Seed Equal Initiative (SEEDEQUAL)** is a CGIAR research initiative focused on ensuring that farmers, particularly women and disadvantaged groups, have equitable access to, and improved choice of, high-quality seeds of climate-resilient, market-preferred, and nutritious crop varieties

additional layers of vulnerability. Female-only extension groups, phone-based outreach, and community women's leaders as intermediaries are the only practical modalities.

### **Cross-Cutting Note: Gender Data and Monitoring**

A recurring weakness identified in the policy review is the absence of sex-disaggregated data for cowpea at state and national level. The project has an opportunity to contribute to filling this gap by:

1. Maintaining sex-disaggregated beneficiary records for all project activities (training, input distribution, demo plots, market linkage events) and reporting these in all progress reports.
2. Conducting a simple Women's Empowerment in Agriculture Index (WEAI) abbreviated survey at baseline and endline to track changes in women's decision-making power, access to resources, and time use in sesame and cowpea farming.
3. Sharing anonymized project gender data with NAERLS and state ADPs as a contribution to improving the national agricultural performance survey database.
4. Documenting lessons learned from gender-responsive activities for dissemination to other projects and to FMAFS's Gender Unit as evidence for policy implementation.

### **3.4 Value Chain Activities across Producing Regions**

Across all producing regions, cowpea cultivation exhibits both commonalities and regional variations. Nwagboso et al. (2024) characterize current production levels by low input use, low-yield varieties, and low productivity. The main challenges encountered in Nigeria's cowpea production encompass a range of issues including high susceptibility to pests and diseases from planting to storage phases, low adoption of improved cowpea seed varieties, poor soil fertility, drought, and heat stress.

The development of Pod Borer Resistant (PBR) cowpea at the Institute of Agricultural Research (IAR), Zaria, represents a major breakthrough in addressing pest constraints (35). With fewer pesticide sprays required and better resistance to insect damage, PBR cowpea helps raise yields, improve quality, lower costs, reduce environmental, health and residue risks, and support export compliance.

Post-Harvest handling, storage, quality constraints and losses are challenges experienced across all producing regions. Saka et al. (2018) identified rodents as a major storage pest constraint in Southwest Nigeria, while in northern zones, the focus has been on addressing insect pest damage, pesticide residue and contamination. The Nigeria Agricultural Quarantine Service (NAQS) reports that failure to meet phytosanitary and pesticide-residue requirements costs the country approximately US\$362.5 million annually in potential export revenue (35).

The success of some commercial farmers in exporting to the UK and US demonstrates the potential for Nigerian cowpea to access premium international markets when quality standards are met (35). The UK market, in particular, offers stable demand and willingness to pay premiums for quality, clean, certified produce.

### **3.5 Gender Dynamics across Regions**

Limited gender-disaggregated data and evidence suggest consistent patterns of gendered participation in cowpea value chains. Saka et al. (2018) found that cowpea production in Southwest Nigeria is male dominated, with men controlling most production decisions. This pattern aligns with findings from northern Nigeria, where, despite women's contributions to processing and marketing, men dominate land ownership, input purchase, and major marketing decisions.

The SheTrades programme, implemented by the International Trade Centre (ITC) through the SheTrades Nigeria Hub hosted by the Nigerian Export Promotion Council, has been active in addressing gender gaps in agricultural value chains (ITC, 2024). In 2023 alone, over 250 women entrepreneurs received training and accessed resources to help them connect to new markets, demonstrating the potential for targeted interventions to enhance women's participation in cowpea and other agricultural value chains.

Additional supporting partners and initiatives include the African Agricultural Technology Foundation (AATF) Partnership with Niger State. The strategic partnership between AATF and the Niger State Government, formalized in April 2024, represents a commitment to cowpea development (AATF, 2024). The collaboration aims to address the national cowpea deficit of over 500,000 metric tons by deploying Pod Borer Resistant cowpea technology. Governor Mohammed Umaru Bago's pledge of 20,000 hectares exclusively for PBR cowpea seed production demonstrates a strong state-level commitment to agricultural transformation. The partnership aims to develop a national plan for cowpea production, with a pilot project in Niger State.

Complementary research by the International Institute of Tropical Agriculture (IITA) has developed a sustainable biocontrol solution for cowpea production. In January 2025, IITA hosted a three-day visit by scientists from Biotalys and representatives of Nigeria's Ministry of Environment to strengthen collaborative efforts to identify causal agents of cowpea leaf-spot disease caused by *Cercospora* across different agroecological zones in Nigeria and to develop protein-based biocontrol solutions (IITA, 2025). Understanding these regional variations is essential for designing targeted, gender-responsive interventions that ensure women farmers across all regions can equitably participate in and benefit from Nigeria's vital cowpea sector.

### 3.6 Overview of the Cowpea Value Chain and Livelihood Context: Fieldwork Findings

The results map gendered roles, production seasons and practices, and structural conditions across the cowpea value chain in Benue State, from pre-harvest activities through post-harvest handling, storage, and traceability. Men largely control land, input purchase, storage, and wholesale, while women dominate planting, weeding, winnowing, shelling, cleaning, and local retail and wholesale. This division of labour, combined with knowledge gaps regarding sanitary and phytosanitary (SPS) requirements and an almost total absence of traceability, creates an unsafe environment for chemical use and food safety, despite strong demand from both women and men for safer storage options. Similar gendered patterns and constraints are documented in cowpea value chains in Nigeria, Malawi, and other African contexts, reinforcing the need for inclusive, gender-responsive interventions (5, 19).

Across the results, Sanitary and Phyto-Sanitary (SPS) risks and opportunities are analysed for:

1. Pre-harvest: choice and use of plant protection products (PPPs), adherence to label instructions and pre-harvest intervals (2, 3, 16).
2. Harvest and post-harvest handling: drying, threshing, and initial insect-control decisions.
3. Post-harvest storage: chemical and non-chemical storage practices, dosage and re-application, container choice, waiting periods, and environmental contamination (1, 4, 6, 7, 9, 10, 13, 18).
4. Traceability and record-keeping: any system (formal or informal) for documenting origin, input use, and storage conditions, which underpins SPS compliance and market access (2, 3, 11, 16).

### 3.7 Seasonal calendar of cowpea production

Cowpea in Benue State follows a two-season cycle: a late-season crop is harvested and stored from December to February, and an early-season crop is planted in March–April and harvested in June–July, with a second planting window in August–September, followed by another harvest from December to February. Land preparation is concentrated in March–April (early) and June–July (late). Weeding occurs around May, and spraying is typically done about one month after emergence, at flowering, and during pod formation.

Storage has shifted from traditional drums and clay pots (sometimes containing pepper) to agrochemical-based preservation (commonly Gammalin 20), creating double dosing and food safety risks because agrochemical use is often learned from agrodealers and peers rather than through formal training.

SN	Activity	JA N	FE B	MA R	AP R	MA Y	JU N	JUL	AU G	SE P	OC T	NO V	DE C
1	Late-season harvest												
2	Drying, shelling & storage												
3	Land preparation (early season)												

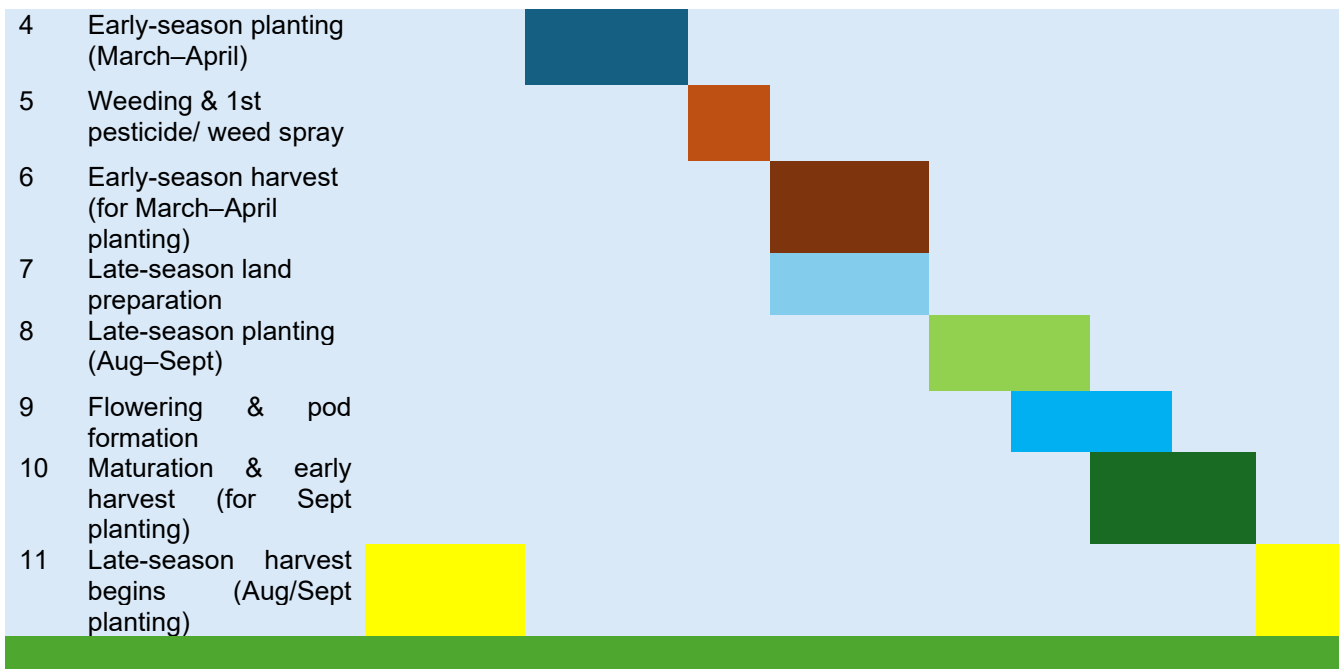


Figure 2: Seasonal calendar of cowpea production among cowpea farmers

Note: Colors are assigned with specific patterns and are intended only to enhance clarity

Green color code indicates high labor intensity for women, covering drying, shelling, storage, and both early- harvests and late-season planting (July–November). Red code denotes medium intensity, primarily weeding and first pesticide application (May), where women assist but men typically lead. Purple and blue code represents low intensity, including land preparations (March–April, June–July), activities that are predominantly male-dominated. Training should be held at low activity periods (April–May) but not during festive holiday. Generally, avoid Friday afternoons (Muslim prayers in northern states – Kano, Katsina, Jigawa, Zamfara, Borno, Yobe, Gombe, Sokoto, Kebbi, Kaduna, Niger, Bauchi, Taraba, Adamawa). Avoid market days (vary by community – consult local women’s groups). Keep sessions less than 3 hours for mixed groups, less than 2 hours for women-only sessions between 9am to 1pm. Provide transport reimbursement or meeting allowances – proven to increase women’s attendance by 40–60%.

### 3.8 Gender roles, responsibilities and decision-making along the cowpea chain

Cowpea farming in Benue State serves as a dual-purpose livelihood, ranking as the "number one" crop for many households because of its short maturity cycle and economic liquidity. Unlike sesame, which is primarily an export cash crop, cowpea functions as both a staple for food security and a cash crop used to finance major expenditures such as school fees and building projects.

The production landscape is characterized by smallholder farmers using manual labor, with a distinct shift towards chemical dependence for weeding and storage due to labor constraints and scale. While varieties such as "Iron Beans" are cultivated, the "White" variety is preferred and most widely grown by both men and women because of higher market demand.

#### Women’s labor underpins production, processing and trading, while men dominate resource control and strategic decisions.

Across Benue State, women undertake most of the planting, weeding, shelling, cleaning, winnowing, cooking, and local retail activities. Planting is identified as a female domain; respondents noted, *"Men don't have time to bend down,"* leaving planting and weeding to women. However, a shift is occurring in weeding practices. While women formerly handled weeding, the increased use of herbicides and pesticides has brought men into this role, as spraying is culturally perceived as a male activity. In post-harvest, women have a dominant role, handling tasks such as harvesting, winnowing, and shelling (dehulling), which they often perform on the farm and mostly at home.

Despite women’s extensive labor input, men control land, input purchases, bulk storage, transportation, and the timing of major sales. This pattern corroborates findings from Nasarawa, Kano, and other West African cowpea systems, where adult men lead most field operations while women dominate processing and petty trading but have

less access to land and key production and processing resources, as well as to knowledge (4, 6, 8, 12). Decision-making about which varieties to plant, what chemicals to buy, and when to store or sell is largely in men's hands, even when women's labour and petty trade sustain household food security, consistent with wider evidence that women's contributions in cowpea and other value chains are substantial but undervalued (1, 3, 5, 8, 9).

### Men and women different positions in the chain shape who bear SPS risk and who benefit.

Men's dominance over large-scale product storage and marketing positions them to capture more gains and make high-stakes decisions about pesticide use and storage conditions. Women, although heavily involved in post-harvest handling and preparing beans for consumption and local sale, rarely participate in or have little say over agri-chemical purchase or traceability practices, echoing broader patterns where participation in value chains does not automatically translate into control or equitable benefits (3, 5, 9).

**Table 3: synthesizes the actors, roles, and gender participation across the cowpea value chain**

Value Chain Stage	Key Actors	Roles and Responsibilities	Gender Participation	Comment
I. Input Supply	Agro-dealers	Supply of seeds, fertilizers, and storage agri-chemicals (DDVP, Gammalin /Sniper).	M+ W-	Men dominate the purchase and application of inputs.
II. Production	Smallholder farmers (< 10 ha)	Cowpea producer,	M+ W+	<i>"Land preparation is for men... planting is generally for women"</i> . Herbicide use and pesticide application are shifting weeding and management to men
		Land preparation, Planting, Weeding - Herbicide application vs. manual pulling, Harvesting,	M+ W- M- W+ M+ W+ M- W+	
		Commercial/investor farmers (> 10 ha)	M+ W-	
III. Post-Harvest activities	Transporters	Transporting harvest	M+ W-	
	Processors	Threshing/Shelling: Removing beans from pods.	M- W+	Women handle shelling at home. Men control long-term storage decisions
		Winnowing: Cleaning chaff.	M- W+	
		Storage: Bagging and chemical preservation.	M+ W+	
		IV. Marketing (Primary)	Primary traders	Retail: Selling small quantities in basins.
	Wholesalers	Wholesale: Bulk aggregation for	M+ W-	Men handle bulk aggregation

		transport to South/East		
	Retailers	Distributing and retailing to consumers	M- W+	Women dominate petty trading and rural retailing – they sell immediately
VI. Consumption	Urban and Rural Consumers	Consuming diverse food products	M- W+	Women dominate the local food vendor, restaurant business and manage household food purchase and preparation

Key: M+ - Many/High Men Involvement; W+ - Many/High Women Involvement; M- Few/Low Men Involvement; W- Few/Low Women Involvement.

The labor division creates horizontal segregation, with women and men providing labor, but men mostly controlling the profits. Crucially, the quality of the final product is determined by actions and decisions made by both genders. This distinct task profile and decisions by value chain actors necessitate a targeted intervention strategy. Interventions must target both genders at their respective roles and control points to maximize compliance and ensure equitable benefit accrual.

### 3.9 Awareness, access to and use of SPS, pesticide and market information

**Men primarily access SPS-related information through agro-dealers, peers, and radio, whereas women rely on informal social networks and local meetings.**

Farmers rarely receive formal training; most information comes from agro-dealers and peers. Men frequently consult pesticide vendors and fellow traders, and occasionally radio, for advice on plant protection products and storage, while women report very limited direct interaction with agro-dealers and minimal exposure to formal SPS or pesticide-safety messages, corroborating broader findings that pesticide use in cowpea is heavily vendor- and farmer-driven rather than guided by regulators or integrated pest management (IPM) extension (2, 3, 16). This also aligns with Nigerian and regional evidence that extension contact, radio and farmer-to-farmer information strongly shape men's adoption of improved storage and management practices, whereas women's access is more constrained by mobility, education and low literacy. Poorly understood label instructions also lead to approximate dosing using buckets and local measures, without regard for recommended rates or safety intervals (1, 2, 7, 9, 13).

Both men and women show low awareness of formal SPS requirements, pre-harvest intervals, MRLs, or export-market expectations, reflecting national-level research that regulatory authorities have limited influence on PPP use in the cowpea value chain, and that vendors and farmers drive pesticide choices (10). One of the male discussant remarks, 'No government agricultural people have come here to teach us how to preserve beans.' Nobody has ever come here to train us. What we know is what the agri-chemical sellers tell us, because when you go there and complain, they tell you what to do.

However, regional studies show that when women receive an extension or participate in structured training, their adoption of improved storage and varieties, as well as associated welfare gains, increases significantly (1, 2, 5, 7, 9).

The assessment uncovered a critical food safety crisis within the cowpea value chain. To mitigate post-harvest losses from weevils, participants report that traditional methods (drums, clay pots with chili pepper and other botanicals) are now considered impractical for larger harvests. This has led to a near-wholesale switch to bulk storage in sacks treated with synthetic pesticides, a pattern observed where hermetic or improved technologies are not widely available or promoted (1,4,7). Women recall that traditional methods were safer but labour-intensive and less suited to commercial quantities. Men's commercial incentives and limited storage options thus underpin a system in which chemicals are the default solution for scale. Farmers and aggregators heavily rely on "Gammalin 20" (lindane), an organochlorine insecticide banned or severely restricted under international conventions, and "Nuvan" (dichlorvos), an organophosphate classified as highly hazardous to human health. These products are now routinely applied (wrapped in towels into drums or bags of beans) in inappropriate doses directly onto legumes,

and other stored foods, not only by farmers but also by market vendors and storage operators seeking to prevent insect damage and extend shelf-life. During the FGDs, marketers/traders report a practice in which beans sourced from the North (often already treated with Nuvan) are transferred into layered sacks and treated a second time with Nuvan as a supplementary measure. This cumulative agri-chemical load ensures the food product is in a state of MRL non-compliance. There is a widely held but scientifically unverified belief that the agrochemical effect "expires" between 4 and 7 months, making the beans safe for consumption<sup>7</sup>.

### **Women and men's lack of information sharing about prior chemical use results in double-dosing and acute health symptoms.**

- The "Double Dosing" Risk: A severe lack of communication exists between actors. Farmers may preserve and store beans before selling, and buyers (marketers/aggregators) unaware of the previous treatment or wishing to extend storage, may treat the same batch again. This cumulative chemical load poses a severe toxicity risk
- Health Implications: Respondents admitted to knowledge of health hazards, citing instances where consumption caused stomachache, vomiting, and potential death *"When you eat some beans, you will know immediately, your stomach will start disturbing you, and sometimes it can even make you vomit. We have heard of places where it even killed people, though not here"*.
- Willingness to Pay: Farmers indicated they would pay between 1,500 and 2,500 Naira for a PICS bag (compared with 900 Naira for a standard sack) if it guaranteed safety and preservation and could be reused. "If there is a sack that preserves beans without chemicals... I can pay 2000". This finding is consistent with broader evidence that smallholders perceive hermetic storage as effective and are willing to adopt it when bags are available and affordable (1, 4, 6, 7, 9, 10, 13, 18). Current barriers in Benue include awareness and access, as hermetic bags are readily available in urban centres (e.g., Makurdi), while rural actors often lack knowledge or are unable to reach suppliers. Women, whose aspirations include children's schooling and improved food security, rather than just income, view safe storage as a route to stable household food and nutrition, echoing findings that PICS adoption can reduce food insecurity and poverty in Nigerian cowpea households (10, 14, 18).
- Visual cues are used perversely with consumers looking for "powder" or insect holes as proof that the chemical has "worked" and expired, ironically viewing insect lifelessness as a safety signal.

These findings establish the baseline for MRL compliance as zero, underscoring the urgent need to introduce and promote safe storage technology. The "double-dosing" issue necessitates sensitization, orientation and training interventions that are coordinated across the entire value chain, targeting not just farmers but also agro-dealers, marketers and aggregators. Additional vital actions include –

- Embed basic SPS and PPP training (hazard awareness, label interpretation, pre-harvest and storage intervals, correct dosage, and banned/approved products) into community-level, farmer-field-style sessions targeted primarily at men storage decision-makers, agro-dealers, and women farmers and processors.
- It is vital to involve plant protection officers/regulators and agronomists to ensure access to up-to-date information on approved products and IPM options, reflecting documented gaps in regulatory influence on PPP use in the Nigerian cowpea chain.
- Integrate "one-time treatment" and "no re-treatment" messages into all storage training, emphasizing that treated grain must be clearly identified and should not be re-dosed.
- Encourage simple, visible marking of treated sacks at the community level (e.g. colored twine, stencil icons indicating "chemically treated", or a branded sack) to warn subsequent buyers, building towards basic traceability (11,16).
- Engage public health and environmental health officers in training to link symptoms (vomiting, stomach pain) and chronic risks to the misuse of storage chemicals, thereby increasing risk perception and uptake of safer alternatives.

<sup>7</sup> Commonly used pesticides by marketers/traders and farmers for cowpea preservation, "Gammalin 20" (lindane), an organochlorine insecticide and "Nuvan" (dichlorvos), an organophosphate, both classified as highly hazardous to human health

- Position non-chemical and low-chemical storage options, including hermetic technologies, as viable solutions for larger volumes, without prescribing a specific brand or subsidizing particular products. Evidence from multiple African settings shows that hermetic bags (PICS and comparable brands) can effectively control pests, prevent weight loss, and reduce pesticide-related health risks.
- Use the expressed willingness to pay as a market signal to engage private distributors and agro-dealers in making safe, chemical-free storage technologies (including but not limited to hermetic bags) available closer to rural communities.
- Integrate evidence from Ghana, Niger, Nigeria, Zimbabwe and Burkina Faso on the effectiveness and profitability of hermetic storage into training and SBCC materials, presenting hermetic bags as one of several safe options and clearly explaining correct use and limitations (e.g. rodent damage, handling) (1, 4, 6, 7, 9, 10, 13, 18).
- Coordinate with extension, agronomists, post-harvest experts, and gender specialists to ensure that economic, agronomic and gendered benefits (e.g. reduced labour, safer food for children, price stabilization) are communicated in ways that resonate with both men and women.

### 3.10 Gender-differentiated access to traceability and certification mechanisms

#### **Women and men do not have access to formal traceability or certification; current sack-marking practices prevent theft but provide zero information for SPS traceability.**

In Benue, traceability in the cowpea value chain is informal and primarily focused on theft prevention rather than quality tracking and assurance. Sacks are informally marked with initials or symbols solely to identify ownership in transit, prevent mix-ups, and trace the source if a bag is adulterated with stones to increase its weight. There is no recording of origin, chemical use, storage dates, or handling history. Only a minority of literate commercial farmers track expenses. This is consistent with findings that smallholders and SMEs across agri-food chains often operate with minimal documentation or traceability due to perceived costs and complexity, despite growing SPS and market demands (2, 11, 16). No actors, men or women, reported engagement in certification schemes (e.g. fair-trade, organic) or awareness of their requirements, paralleling work highlighting high certification costs, strict criteria, and weak institutional support as barriers to certification in Nigerian agriculture (16). Given the findings on misuse of pesticides in cowpea preservation and cross-border flows of unregistered products (2, 3, 16), the absence of any input history means SPS non-compliance cannot be detected or is difficult to correct along the chain.

#### **Women's limited control over assets and market channels further limits their ability to engage with future traceability and certification.**

Given lower asset ownership, literacy, and group membership in many Nigerian cowpea contexts, women are less likely than men to meet the preconditions for certification or to lead record keeping, even where both face the same systemic absence of traceability (3, 5, 6, 8, 9, 11). Evidence from gender-responsive breeding and value-chain initiatives shows that without deliberate social targeting and the inclusion of women in farmer organizations and multi-stakeholder platforms, new institutional mechanisms (including traceability and certification) tend to be captured by better-resourced male actors (2, 4, 8).

The project should seek to

- Establish a simple, low-literacy traceability and record-keeping system at farm and first aggregation points, building on existing sack-marking habits: e.g. icons, color codes, or colored sacks indicating "chemically treated" versus "non-chemical storage, date of last treatment, and location.
- Provide basic training on traceability concepts for farmers, aggregators and traders, linking them explicitly to export bans, border rejections and domestic health protection, in line with recommendations to pair traceability with clear incentives and regulatory objectives (2, 3, 11, 16).
- Involve SPS regulators, food safety authorities, and ICT/traceability specialists to ensure that tools are aligned with national, regional and international residue monitoring initiatives and could later connect to digital systems.

### 3.11 Preferred Information channel, training format and time/period

The disconnect between extension services and farmers is evident, with many noting they have never received training in preservation. To bridge the SPS compliance gap, interventions must be tailored to the community's social dynamics.

### **Women's mobility restrictions and mixed-group dynamics limit participation in SPS-compliant nodes, despite strong potential benefits.**

Women's movement outside the community is often restricted by norms, and their daily schedules are crowded with unpaid care work, reducing attendance at distant or mixed-sex trainings where they cannot speak freely or ask questions when SPS, safe pesticide use or improved storage are discussed. Similar gendered constraints on mobility, land, credit and leadership roles have been shown to limit women's participation in cowpea trials, innovation platforms and marketing in Mali, Ghana, Nigeria and Zambia (1, 2, 4, 5, 8, 9). Yet women are the primary actors in planting, weeding, winnowing, shelling, sorting and household bean preparation. Studies from Zambia and northern Nigeria show gains in production, food security and poverty reduction at household level when women do participate in cowpea value-chain activities and adopt improved technologies (1, 7, 9, 13).

#### **Preferred Information Dissemination Channels:**

- **Community Meetings and Farmer Associations:** Both men and women rank these highest. Face-to-face interaction is trusted and allows for questions.
- **Demonstration Plots:** Extension agents emphasize that "*farmers learn from practical,*" advocating for community-based demonstrations over venue-based workshops.
- **Radio:** A secondary preference for men, but less effective for women due to lower access and time constraints
- **Preferred languages:** local dialect (TIV, Idoma etc.), Pidgin English for non-literate and English Language for literate actors

Actors had reservations about technology-dependent communication (radio, social media) due to poor connectivity and low smartphone ownership. They prioritize demonstration plots (for practical learning) and face-to-face community meetings through their farmers' associations (for trusted dissemination). Findings from the seasonal calendar indicate that the ideal training window is February to March (pre-season planning) or June (approaching harvest for early planters).

The women's mobility challenge requires gender-responsive design for the project's training intervention. The project should leverage existing social networks to overcome digital and infrastructural barriers. Decentralized, community-level training is the most viable option for most women. Training should be gender-segregated to ensure women can speak freely and assimilate knowledge without the constraints of mixed-gender gatherings. Women prefer training when their children are on holiday, allowing them to stay at home with a trusted guardian, fully concentrate and learn, and even receive better clarification and practice from their educated children.

### **3.12 Perceived Livelihood Status, Agency, Benefits and Aspirations**

Cowpea is central to the economic stability of rural communities in Benue State. It serves as a "*rescue crop*" during the famine period (June-August) before yams are harvested. A clear gender difference exists in how benefit is valued.

#### **Women's benefits and aspirations focus on children's schooling and food security, but current metrics track only yields and income.**

Women view cowpeas as a source of independence. "We tell our husbands that this bean money is our own work, sweat and reward." Women prioritize outcomes such as keeping children in school, reducing hunger, and improving household diet quality, whereas men more often emphasize aggregate income and asset acquisition, including building houses, buying cars, renting farm implements, and paying university school fees. This mirrors wider evidence that gender differences in preferences and priorities are often overlooked in agricultural interventions, with limited tracking of agency or welfare indicators beyond yield and profit (5, 19).

**Aspirations:** Women are highly motivated to adopt new technology if it is accessible. Their core needs are clear and practical: access to financial capital to scale up, and the ability to purchase affordable processing equipment and safe storage solutions. When introduced to the concept of hermetic (PICS) bags that require no chemicals, farmers expressed strong willingness to adopt them.

The project should integrate gender-sensitive impact metrics that go beyond increased income figures to track income for 'what needs' by women and men actors regarding their livelihood and household welfare. Examples of

indicators are children's schooling and retention, self-reported food security, women's decision-making over cowpea income and storage, and perceived reductions in health problems from beans. It is vital to involve social scientists and monitoring & evaluation specialists to design and validate these qualitative indicators and ensure they are feasible to track over time.

By addressing their need for training, financial capital and safe storage, the project can simultaneously achieve SPS compliance (safer storage) and equitable agency (increased control over profits and benefits).

### **3.13 Problem tree analysis shows gender-specific barriers for SPS-compliant among cowpea value chain actors**

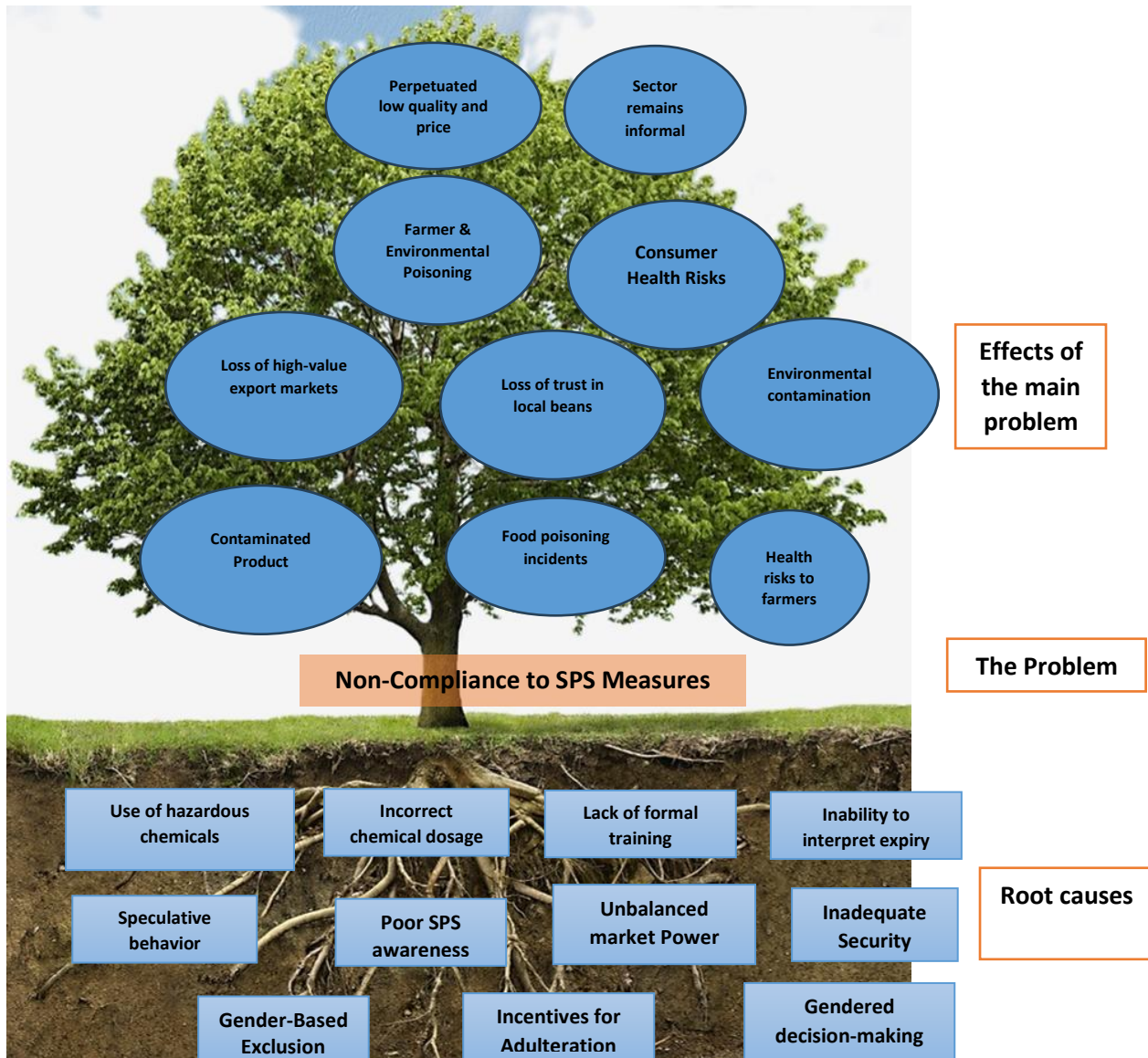
Non-compliance with SPS measures in cowpea production arises from a combination of insecurities, unsafe chemical practices, knowledge gaps, access to agricultural productive resources and finance, and structural limitations in the value chain.

#### **Structural Barriers: Finance, Insecurity and Gendered Mobility**

High labor and herbicide costs, combined with volatile prices, reduce incentives to invest in quality inputs or storage. Insecurity shortens the time farmers can safely spend on distant fields, compressing operations and potentially encouraging quick agri-chemical "solutions." Cultural norms restrict women's mobility and their access to off-farm training or markets, despite their central role in production and post-harvest work. Similar structural constraints, such as limited access to finance, distance to markets and gendered resource access have been shown to limit adoption of improved post-harvest technologies and reduce household welfare among cowpea farmers in Nigeria and the Sahel (10, 14, 15, 18).

Communities also stand a higher risk of environmental contamination, as agri-chemicals penetrate and migrate into soils and household storage environments. Beyond health impacts, trust in locally and organically produced cowpea diminishes when buyers encounter pesticide residues or contamination signs, potentially reducing market value and widening the gap between compliant and non-compliant producers.

Although anchored in Benue, these findings offer a foundation for designing SPS interventions across Nigerian cowpea hubs.



**Figure 3: Problem tree showing the causes and consequences of non-compliance with SPS measures**

**Men’s structural advantages enable adoption of technologies and practices that could support SPS compliance, but without gender-responsive design, they may widen gaps.**

Men farmers and traders generally have better access to extension services, producer groups, agro-dealers and urban markets, which are key determinants of adoption of improved cowpea varieties, PICS bags and other innovations. However, there is consistent evidence that training and extension can increase average empowerment while also widening intra-household gender gaps if content, timing and venues are not tailored to women’s constraints (3, 5).

## 4.0 DISCUSSION

The study reveals a cowpea value chain where women's labor sustains production and post-harvest handling, while men control productive assets, storage, transport, marketing decisions and interactions with input and output markets. This basic gender pattern is highly consistent with evidence from other Nigerian cowpea hubs (Nasarawa, Kano, Born, northern dry savannah) and from Mali, Ghana, Malawi, Mozambique and Tanzania, where men dominate field operations and resource control and women concentrate in processing and petty trade with weaker decision-making power (3,4,5,8,12,15,17). This supports application of the Benue findings to other Nigerian cowpea corridors, while recognizing agro-ecological and cultural variation.

### 4.1 Gender Issues across the Cowpea Value Chain

#### 4.1.1 Input Supply and Production

Across Nigeria's cowpea hubs, men have more access to land, credit, inputs, and to participate in innovation platforms and farmer organizations that facilitate technology uptake (3, 5, 8, 10, 14, 17, 18). Women's mobility restrictions, insecure land rights and lower access to productive resources limit their ability to learn about SPS-relevant good agricultural practices (GAP), including recommended pesticide regimes (3, 5, 9, 10, 14, 16).

#### 4.1.2 Pest Management, Pesticide Use and Storage

Reliance on synthetic pesticides for both field and storage insects/pests, with limited training and dosage control, echoes regional concerns about high pesticide dependence, unsafe practices and health/environmental risks (11,16). Gendered access to information is crucial: men receive more advice from agro-dealers and radio, while women often rely on informal observation, making them particularly vulnerable to hidden residue risks when handling beans.

Studies on PICS adoption in northern Nigeria indicate that awareness, extension contact, and access to bags significantly influence uptake, with gender-specific determinants. Women's adoption is more sensitive to education, awareness and sack availability. Without explicit targeting, men are likely to continue to capture the benefits of safer storage technologies and practices, leaving women behind and unable to access more profitable markets for safe products in local and export markets.

#### 4.1.3 Post-harvest Handling, Processing and Hygiene

Women's dominance in drying, shelling, milling and food preparation is consistent across cowpea systems (3, 4, 7, 12, 15, 17). Yet they often lack basic infrastructure (drying mats, clean storage, and protective equipment) and training on Good Hygienic Practices, increasing risks of microbial and physical contamination.

Evidence from Ghana and Burkina Faso shows that post-harvest practices such as drying on bare ground and poor storage are common and linked to fungal contamination and quality loss, even when mycotoxins occasionally remain below Codex limits (7, 8). Women thus sit at a critical SPS control point but with the weakest support.

#### 4.1.4 Marketing, Traceability and Certification

Market participation can be substantial for both genders, but pathways, volumes, and income control differ. In Benue, both men and women sell within and outside the village through conventional channels—local buying agents (LBAs) but men tend to have higher education and group membership, strengthening their bargaining power and access to information and export companies (4).

In Nigerian contexts, documentation, traceability and certification are limited for all smallholders, but women's weaker asset base, literacy and organizational membership make it harder for them to meet the preconditions for future traceability or certification schemes. Without gender-responsive design, emerging SPS and certification requirements risk deepening gender gaps by favoring better-resourced men farmers and actors.

## 4.2 Towards Inclusive and Gender-Responsive SPS Interventions

Evidence from fieldwork, gender-responsive research, and extension and innovation platforms points to several actions for inclusive SPS-compliant cowpea value-chain development in Nigeria:

### 4.2.1 Multi-disciplinary, Gender-Responsive Teams

SPS and IPM programs that embed gender experts, food safety scientists and economists alongside extensionists and agronomists are better able to integrate gendered preferences, labor patterns, and social norms into dissemination strategies, leading to more widely adopted practices (1, 5, 6, 8, 11, 18). SPS projects should mirror this model by including gender, social inclusion, food safety/SPS and post-harvest specialists from intervention design through implementation and monitoring of impact outcomes.

### 4.2.2 Deliberate Social Targeting and Women's Inclusion

Proactive outreach, quotas for women in trainings, and the use of women-only and mixed sessions can enhance participation, as demonstrated in gender-responsive value-chain initiatives in Ghana, Mali, and Zambia (1, 3, 5, 6, 8, 15). SPS interventions should therefore invest in decentralized, community-level training that:

- Use visual and practical tools to overcome literacy barriers.
- Times training formats and schedules to fit women's and men's seasonal and daily workloads.
- Integrates content on safe pesticide use, non-chemical and low-chemical IPM options, and post-harvest hygiene.

### 4.2.3 Gender-Sensitive Promotion of Safer Storage and IPM

Experiences shared by users in this study, as well as evidence from Nigeria and West Africa, show that hermetic storage technologies substantially reduce storage losses and reliance on pesticides, benefiting both women and men when information, availability, and affordability are addressed (1, 2, 7, 9, 11, 13, 16).

Within SPS projects, hermetic bags and other safe options can be used as illustrative technologies in training and demonstrations, presented as non-chemical solutions. Interventions should track and address gender-specific adoption determinants (education, awareness, bag availability, control of income) to avoid reinforcing existing inequalities (2).

### 4.2.4 Inclusive Traceability and Documentation

While current traceability remains minimal across most smallholder cowpea systems, inclusive approaches can begin with simple, low-literacy tools co-designed with women and men farmers and traders. Building on evidence that social structures and group membership drive adoption, basic record-keeping and marking systems should be embedded in existing farmer groups and women's associations, rather than only in male-dominated commercial networks (3, 5, 6, 8, 11, 16).

### 4.2.5 Gender-Equitable Benefit Sharing and Agency Metrics

Studies from Zambia, Ghana, Mali and Malawi show that increased women's participation in cowpea value chains improves household production, food security and poverty outcomes (1, 10, 15). However, conventional monitoring often focuses on yield and income, neglecting women's decision-making power, control of income and time burdens. SPS interventions therefore require explicit gender-equity objectives and indicators tracking women's roles in SPS-related decisions, income control, time burden reduction, food security and children's education and welfare outcomes.

These findings show that SPS-compliant cowpea value-chain development is unlikely to succeed or be sustainable without intentional gender mainstreaming. Women’s concentrated role in post-harvest handling and local markets makes them indispensable actors in managing microbial hazards, initiating traceability and ensuring correct use of safer storage technologies. Men’s control over assets, pesticides and bulk marketing positions them centrally in chemical risk management and compliance. Only an integrated approach that engages both women and men and systematically addresses gendered constraints can deliver SPS objectives alongside equitable livelihood outcomes.

### 4.3 Policy and Programme Review — Support to Cowpea Value Chains in Nigeria

Nigeria has developed an extensive, if uneven, body of agricultural and food policy that directly affects the cowpea value chain. A Gender in Agricultural Policy (GAPo) analysis of 13 major policy instruments, using 32 gender indicators across thematic areas including land, rural organizations, financial services, employment, markets, value chains, research, extension, and technology, reveals a stark polarization in the gender responsiveness of Nigeria’s policy landscape. While the newest generation of agricultural policies demonstrate genuinely transformative gender ambitions, the food safety and food systems policies that most directly govern cowpea production, processing, and export are almost entirely gender blind. Reviewed across policy cycles, there is a discernible trajectory from gender-blind (ATA, 2011–2015) to increasingly gender-aware framing (APP, 2016–2020; NATIP, 2022–2027), though the overall pattern is one of incrementally stronger policy language unaccompanied by commensurate implementation (see Table 4 for a full comparative review of policy and programme scope, support categories, gender dimensions, and implementation outcomes).

This policy gap has direct operational consequences. Women dominate post-harvest handling, drying, cleaning, sorting, processing, and local trade in the cowpea value chain — the very activities that determine SPS compliance, food safety outcomes, and export quality. Yet the policy frameworks governing these activities fail to recognize, support, or resource women’s roles. The following review presents the GAPo findings, assesses each policy’s specific relevance to cowpea, and identifies the project’s implications and entry points.

A critical systemic finding across all programmes is the persistent gap between policy design and ground-level implementation on gender. While Nigeria’s National Gender Policy in Agriculture (2016) is among the most explicit agricultural gender policy instruments in West Africa, mandating gender training for all intervening organizations, sex-disaggregated data, and gender-responsive budgeting, its provisions have not been operationalized through state-level Agricultural Development Programmes (ADPs), extension service staffing, or programme monitoring systems for cowpea specifically. The underlying reasons are structural and mutually reinforcing: the non-availability of female extension personnel, absence of sex-disaggregated data for planning, exclusion of women from programme-level decision-making, and women’s limited access to land-based collateral. Gender commitments embedded in policy documents have not been translated into dedicated budget lines, staffing norms, or performance indicators at state or programme level.

Table 4 presents the GAPo scoring results across thirteen policies, ranked from lowest to highest gender integration. Scores are expressed as the number of gender indicators addressed out of 32. The color-coded level classification follows the GAPo grading framework: Level 1 (gender-blind) through Level 5 (gender-transformative).

Table 4: Policy Review and Categorization and Relevance to the Cowpea VC in Nigeria using GAPo

Policy / Programme	GAPo Score (out of 32)	Level	Gender Integration Category	Relevance to Cowpea Value Chain
National Food Safety and Quality Bill (2022)	0 (0%)	Level 1	No integration — gender-blind	Directly governs cowpea food safety standards; the complete absence of gender provisions renders women, as primary food handlers, invisible in the regulatory framework

National Policy on Food Safety and Its Implementation Strategy — NPFSIS (2014)	1 (3%)	Level 1	No integration — gender-blind	Governs cowpea SPS compliance; treats food safety as a purely technical domain despite women's dominance in post-harvest handling and processing
Revised NPFSIS (2024)	1 (3%)	Level 1	Minimal recognition, no measures	2024 revision fails to incorporate any new gender provisions despite evidence that women are primary actors determining SPS compliance outcomes for cowpea
NSPRI Food Safety Policy 2024–2030	1 (3%)	Level 1	No integration — gender-blind	NSPRI mandate directly addresses post-harvest storage of cowpea — where women are primary actors. Fails to recognize women as key users of storage technologies or as determinants of SPS compliance
National Policy on the Environment — NPE (Revised 2016)	3 (9%)	Level 1	No integration — gender-blind	Relevant to cowpea chemical use and land degradation; women's weeding burdens increase as soils degrade, but the NPE cannot guide gendered environmental responses
Agriculture Promotion Policy — APP (2015–2020)	6 (18%)	Level 2	Low integration — acknowledges inequalities, no specific measures	Cowpea explicitly prioritized for export; mentions gender equality as cross-cutting objective but lacks specific measures. Women's cleaning/sorting for MRL compliance unaddressed
Economic Recovery and Growth Plan — ERGP	8 (25%)	Level 2	Low integration — acknowledges without measures	ERGP's emphasis on non-oil exports aligns with cowpea export goals; women's SPS compliance training reframeable as export-enhancing investment, but policy provides no gender tools
National Agricultural Seed Policy — NASP (Revised 2022)	14 (44%)	Level 3	Moderate — some generic and few specific measures	Improved pest-resistant cowpea varieties reduce pesticide dependence (critical for SPS). Women's access to certified seeds constrained by land tenure, mobility, financial barriers
Nigeria Digital Agriculture Strategy — NDAS (2020–2030)	20 (70%)	Level 4	Good gender integration in digital domain	Includes targeted digital literacy, relevant to traceability and market information for cowpea. Women's low digital literacy and phone access documented as barrier
National Agricultural Extension Policy — NEP (2017)	26 (80%)	Level 4	Strong gender integration with transformative elements	Strongest mandate for gender-responsive extension: female extension agents, women's groups as entry points, and scheduling flexibility. Only 6–15% of Nigeria's extension workers are women; implementation is severely constrained
National Agricultural Technology and Innovation Policy — NATIP (2022–2027)	30 (96%)	Level 4/5	Purposefully tackles inequalities through specific measures	Explicitly prioritizes cowpea as the target crop; strong gender provisions requiring women's access, control and benefit from technology; SAPZs offer a pathway for women from laborers to agripreneurs
National Food and Nutrition Policy — NFNP (2016)	31 (98%)	Level 4/5	Comprehensive gender integration with	Legitimizes women cowpea processors as nutrition actors; supports gender-equitable market participation;

			transformative elements	intersectional approach reaches young and migrant women in the value chain
National Gender Policy in Agriculture — NGPA (2025–2030)	32 (100%)	Level 5	Comprehensive gender-transformative policy	Strongest possible mandate for the project's gender strategy; emerged from 1,200+ stakeholder consultations; dedicated budget lines from 2026; explicitly addresses discriminatory social norms, GBV, care responsibilities, and intersectionality

Source: GAPo analysis of policy documents. Gender Integration Index: High ( $\geq 75\%$ ): NGPA, NATIP, NEP, NFNP; Moderate (40–74%): NDAS; Low (10–39%): ERGP, NASP, APP; Minimal ( $< 10\%$ ): NPFSIS 2014, Revised NPFSIS 2024, NPE, NSPRI-FSP; None: Food Safety Bill 2022.\*

**Four overarching findings emerge from the GAPo analysis with direct implications for how this project engages the policy environment:**

- **The policies most relevant to cowpea food safety are the least gender responsive.** The food safety governance gap: The National Food Safety and Quality Bill (2022), the NPFSIS (2014 and 2024 revision), and the NSPRI Food Safety Policy (2024–2030) all score at Level 1, with zero to one gender indicator addressed. These are the very instruments that govern MRL compliance, post-harvest handling standards, and SPS certification — activities dominated by women in the cowpea value chain. The food safety system is thus structurally misaligned with who actually does the work it seeks to regulate.
- **The policies with the strongest gender provisions are the newest and least implemented.** The implementation gap: The NGPA (2025–2030, Level 5), NATIP (2022–2027, Level 4/5), and NFNP (2016, Level 4/5) offer strong — in the NGPA's case, transformative — gender mandates. However, all suffer from the same systemic weakness documented in the Nigerian agricultural policy landscape: weak accountability mechanisms, under-resourced gender desks, and no sex-disaggregated monitoring data for cowpea specifically.
- The extension policy provides the strongest actionable mandate for this project. The NEP as project anchor: The National Agricultural Extension Policy (NEP, 2017) scores 26/32 and provides an explicit legislative basis for recruiting female extension agents, designing gender-sensitive materials, scheduling extension visits around women's time constraints, and using women's groups as primary entry points for extension. Despite only 6–15% of Nigeria's extension workers being women, the NEP gives this project the policy authority to advocate for and collaborate with state ADPs on gender-responsive extension delivery for cowpea farmers and processors.
- The NGPA (2025–2030) is the most significant new policy development for this project. The NGPA is the overarching mandate: Gazetted following an unprecedented year-long consultative process involving more than 1,200 stakeholders across six geopolitical zones, the NGPA is Nigeria's first comprehensively gender-transformative agricultural policy. It introduces dedicated budget lines from 2026 onward, explicitly addresses discriminatory social norms, gender-based violence, care responsibilities, and intersectionality, and scores a perfect 32/32 on the GAPo framework. This project should formally align its gender strategy with NGPA provisions and document how its activities contribute to NGPA implementation at the state and community levels.

**4.4 Policy-by-Policy Analysis: Implications for the Cowpea Value Chain**

**Food Safety Policies: Gender-Blind Frameworks Governing Women's Work**

The NPFSIS (2014) and its 2024 revision focus on establishing an Integrated Food Safety Management System using a risk-based HACCP approach. However, both treat food safety as a purely technical domain, failing to acknowledge the gendered division of labor that shapes food safety outcomes in practice. Women in Benue and Nasarawa States dominate post-harvest drying, cleaning, sorting, and storage of cowpea, the precise activities through which mycotoxin contamination, pesticide residue accumulation, and foreign matter enter the commodity chain. Yet neither instrument provides gender-responsive guidance for these actors.

The NSPRI Food Safety Policy (2024–2030), despite its specific mandate for post-harvest issues, similarly fails to recognize women as primary users of storage technologies or as the key actors, whose practices determine SPS compliance. This is particularly consequential for cowpea, where women's storage decisions, including the use and overuse of chemical pesticides in response to weevil pressure, directly determine whether export shipments meet EU MRL standards.

#### **Key GAPo Gaps in Food Safety Policies (relevant to cowpea):**

- Indicator 1: No recognition of women's roles as primary food handlers, processors, and preparers most exposed to food safety risks
- Indicator 5: No requirement for sex- and gender-disaggregated data in food safety monitoring
- Indicator 22: No acknowledgement of gendered participation in markets where unsafe products circulate

**Project entry points:** This project can collaborate with NAFDAC, NSPRI, and relevant stakeholders to advocate for policy reform integrating gender-responsive indicators into food safety monitoring systems, and to document through its own M&E how women's food safety practices are constrained by lack of resources (tarpaulins, PICS bags, clean drying surfaces) and how providing these resources improves SPS compliance outcomes for cowpea. This evidence can directly inform future policy revisions.

#### **Agriculture Promotion Policy (APP, 2015–2020): Acknowledging Without Acting**

The APP (Level 2, 6/32) explicitly aimed to build a high-quality brand for Nigerian agricultural exports and identified cowpea as a priority commodity. It recognized gender equality as a cross-cutting objective but provided no specific measures, budget lines, or indicators. For cowpea, where women dominate cleaning and sorting — activities critical to meeting MRL standards — the APP's quality branding agenda was operationally dependent on women's labor but offered women no targeted support.

**Project entry points:** The project should position women's SPS compliance training as an implementation of the APP's quality brand objective — making visible the contributions the policy acknowledges in principle but never supported in practice. Project evidence on how gender gaps in food safety information undermine export competitiveness can generate pressure for more specific gender provisions in the APP's successor frameworks.

#### **National Food and Nutrition Policy (NFNP, 2016): Strong Mandate for Cowpea Interventions**

The NFNP (Level 4/5, 31/32) provides a strong policy mandate for gender-responsive food systems work. For the cowpea value chain specifically, where women's processing and marketing activities directly affect household nutrition, the NFNP legitimizes this project's communication campaign and efforts to train women processors on safe storage, advocate for women's inclusion in value chain upgrading, and design training schedules that accommodate women's multiple care responsibilities. The NFNP's intersectional approach also supports targeted outreach to young women and migrant women farmers, who face compounded barriers in the cowpea value chain.

#### **National Agricultural Extension Policy (NEP, 2017): The Strongest Project Mandate**

The NEP (Level 4, 26/32) provides the most immediately actionable policy mandate for this project's training and advisory activities. It explicitly recognizes that women face specific constraints — mobility restrictions, time poverty, and socio-cultural norms — that limit their access to extension services. It legislates for the recruitment of female extension agents, gender-sensitive training materials, scheduling flexibility, and women's groups as extension entry points. However, implementation remains severely constrained: currently, only 6–15% of Nigeria's extension workers are women, and in many rural cowpea-growing communities, socio-cultural factors prevent women from interacting with male extension agents, leading them to miss climate-smart agriculture training, SPS compliance information, and mechanization support.

**Project entry points:** The NEP provides legislative backing for the project to advocate with state ADPs in Benue, Nasarawa and all producing, processing and marketing states across Nigeria, for women's inclusion in SPS compliance training, for the deployment of female extension agents in cowpea-producing LGAs, and for the

institutionalization of gender-responsive extension scheduling. This is not a project preference — it is a legislated requirement.

#### **NATIP (2022–2027) and NDAS (2020–2030): Technology Policy with Strong Gender Provisions**

The National Agricultural Technology and Innovation Policy (NATIP, Level 4/5, 30/32) is Nigeria's principal framework for agricultural modernization. It explicitly identifies cowpea as a priority crop and requires that all technology promotion consider women's access, control, and benefit. Its Special Agro-Industrial Processing Zones (SAPZs) offer a concrete mechanism for women's transition from low-income processors to agripreneurs with access to cold chain logistics, packaging, and marketing infrastructure. The project should use NATIP to advocate for women cowpea farmers' inclusion in aggregator training programmes and for the design of traceability systems that accommodate low literacy levels.

The Nigeria Digital Agriculture Strategy (NDAS, Level 4, 20/32) recognizes the gendered digital divide and includes targeted digital literacy provisions. Given that cowpea value chain analyses document low digital literacy particularly among women and a preference for face-to-face communication, NDAS provisions can be used to advocate for simple, accessible digital tools — color-coded sacks, basic SMS price alerts, pictorial record-keeping as gender-appropriate first steps toward traceability, rather than technology-intensive solutions that replicate existing exclusions.

#### **National Gender Policy in Agriculture (NGPA, 2025–2030): The Overarching Framework**

The NGPA (Level 5, 32/32) is Nigeria's most significant recent policy development for this project. Emerging from a year-long consultative process with over 1,200 stakeholders across six geopolitical zones, it is the first comprehensively gender-transformative agricultural policy instrument Nigeria has produced. It explicitly addresses discriminatory social norms, gender-based violence, care responsibilities, and intersectional dimensions including age, disability, ethnicity, and marital status. Critically, it introduces dedicated budget lines for gender activities in agricultural programmes from 2026 onward — addressing the chronic under-resourcing that has undermined implementation of earlier policies.

**Project entry points:** This project should formally align its gender strategy with NGPA commitments and document how its activities contribute to NGPA implementation at national, state, and community levels. The NGPA's requirement for sex- and gender-disaggregated data provides a mandate for strengthening the project's M&E systems. Project evidence should be fed back to FMAFS's Gender Unit as a contribution to NGPA accountability.

#### **National Agricultural Seed Policy (NASP, Revised 2022) and NSPRI-FSP: Partial Recognition**

The NASP (Level 3, 14/32) is particularly relevant because improved, pest-resistant cowpea varieties directly reduce pesticide dependence — a core SPS concern. However, women's access to certified seed is constrained by land tenure, mobility, and financial barriers that NASP's generic measures do not adequately address. The project should advocate for NASP implementation guidelines that include specific targets for women's access to improved cowpea varieties, and document how women's use of improved varieties affects pesticide use patterns and SPS compliance.

The NSPRI-FSP (Level 1, 1/32) presents an immediate advocacy opportunity: partnering with NSPRI to pilot gender-responsive dissemination of hermetic storage technologies (PICS bags) using women's groups as entry points, and documenting women's adoption rates and food safety outcomes to generate evidence for the policy's first gender-responsive revision.

#### **4.5 Federal and State-Level Gender-Responsive Initiatives in Cowpea-Producing States**

Beyond the formal policy framework, several of federal and state-level initiatives have specifically targeted gender inclusion in cowpea value chains. These initiatives provide both models for project design and potential partnership opportunities.

##### **Federal Level: The Sovereign AgroTrade System (SAS) and Nigerian Women for Agricultural Progressive and Development Initiative (NWAPDI)**

The Federal Ministry of Agriculture and Food Security, in partnership with the Nigerian Women for Agricultural Progressive and Development Initiative (NWAPDI), has launched the Sovereign AgroTrade System (SAS), a digital agricultural marketplace designed to empower women and youth. The platform integrates four tools: AgriXchange Marketplace (direct trading and online auctions), NWAPDI Grow (micro-loans, cooperative financing, savings platforms, and mobile payments), AgriCert (quality certification and traceability), and FarmAssure (data-driven farm management). The NWAPDI National Coordinator has described SAS as a commitment that farmers will no longer depend on intermediaries, volatile markets, and unreliable payment systems. The AgriCert and NWAPDI Grow components are directly relevant to cowpea value chain actors, offering a potential pathway to quality certification and financial inclusion for women's cooperatives in Benue, Nassarawa, and other producing states across Nigeria.

##### **Benue State: International Fund for Agricultural Development (IFAD) - Value Chain Development Programme (VCDP)**

Benue State has been a focal area for IFAD's Value Chain Development Programme (VCDP), which has targeted women producers, processors, and marketers in staple value chains. The VCDP demonstrates the potential of value chain programmes to strengthen women's income, skills, and access to extension services in Benue, and provides an institutional partnership precedent for this project. VCDP's experience of working with women's groups in Benue — including its approach to group formation, savings mobilization, and market linkage — offers directly transferable lessons for cowpea activities.

##### **Nasarawa State: The Nasarawa Agricultural Development (NADP) and the FSSS Gender Analysis**

The Nassarawa Agricultural Development Programme (NADP) has implemented gender-sensitive extension approaches, though coverage remains limited. Nasarawa's inclusion in the Food Systems and Seed Security (FSSS) gender analysis — covering 10 northern states — has generated evidence of women's exclusion from seed trials and extension services and produced recommendations for gender-responsive variety-testing protocols directly relevant to this project. The FSSS findings can serve as existing evidence to accelerate NADP's adoption of gender-responsive extension practices in cowpea-producing LGAs.

##### **Kano State (and the Wider North): Dawanau and the Limits of Market-Level Gender Engagement**

Kano's Dawanau market is the largest cowpea trading hub in West Africa. Women are present in large numbers as retail traders in Dawanau, but they are rarely reached by formal extension or SPS compliance training, which is directed at male aggregators and export-focused traders. No state-level gender-specific initiative for women cowpea traders in Kano has been identified through desk research, representing both a gap and an opportunity. Engaging the Kano ADP gender desk and Dawanau market women's trade associations — even through remote key informant interviews — would provide valuable data on women's market-level constraints and identify entry points for future project engagement.

##### **Kogi State: Capacity-Building for Women Cowpea Producers**

Kogi State, an important Middle Belt cowpea-producing zone with significant women's value chain participation, offers a model of government-led gender-focused support. The Kogi State Government, through the Ministry of Commerce and Industry in collaboration with NEPC, organized a capacity-building workshop themed 'Empowering Women Cowpea Producers for Global Markets Through Good Agricultural Practices (GAP)', bringing together stakeholders to explore strategies for quality, safety, and sustainability in women's cowpea farming. This initiative demonstrates both the political will at state level and a replicable modality — government-convened, multi-stakeholder, women-targeted, GAP-focused — that could be adapted for activities in Benue and Nasarawa.

#### 4.6 Policy Environment Assessment for Project Gender Strategy

The GAPo analysis reveals that this project operates in a policy environment characterized by two coexisting realities: a new generation of gender-transformative agricultural policies (NGPA, NATIP, NEP, NFNP) that provide strong legal and institutional mandates for gender-responsive interventions; and a food safety governance framework (NPFSIS, Food Safety Bill, NSPRI-FSP) that is almost entirely gender-blind and structurally unable to support the women whose labor determines SPS compliance outcomes for cowpea. The project's strategic response should be to: (i) explicitly anchor its gender strategy in the NGPA (2025–2030) and NEP (2017) as the two strongest legislative supports; (ii) use its M&E data to generate the sex and gender-disaggregated food safety evidence that current food safety policies lack and require; (iii) partner with state-level initiatives (IFAD VCDP in Benue, NADP in Nasarawa) to extend reach without duplicating effort; and (iv) feed project evidence back into policy advocacy aimed at the next revision of the NPFSIS and NSPRI-FSP.

#### 5.0 CONCLUSION

The study demonstrates that gendered roles, access to resources and agency strongly shape SPS-relevant nodes in the cowpea value chain in Benue State and across comparable Nigerian and regional hubs. Women's intensive labor in production, and especially in post-harvest handling, combined with men's control over land, inputs, storage and market access, creates asymmetric exposure to chemical and microbial risks and unequal access to the benefits of value-chain upgrading. Weak extension systems and gender-blind technology design have reinforced these inequities, limiting women's adoption of safer storage and integrated pest management (IPM), despite strong evidence that women's participation in cowpea value chains improves production, food security and poverty outcomes (1, 2, 5, 7, 9, 10, 13, 15).

Based on cowpea production volume, concentration of women actors, and low access to extension and SPS training, the project should specifically target the following states:

Priority	State	Rationale
Tier 1 (Highest)	Kano, Katsina, Jigawa, Zamfara	Highest cowpea production (>60% of national output); very high women's participation in post-harvest activities; low prior SPS extension reach to women.
Tier 2 (High)	Benue, Borno, Yobe, Gombe, Bauchi, Kaduna	Conflict-affected areas with disrupted extension services; women often head of households; high need for gender-responsive SPS training.
Tier 3 (Moderate)	Sokoto, Kebbi, Niger, Taraba, Adamawa	Growing cowpea areas; women's cooperatives active but lack technical support on MRLs and pesticide reduction.

**For Sesame:** Target Benue, Nasarawa, Jigawa, Kano, Katsina, and Gombe – where sesame production is expanding and women dominate harvesting and cleaning.

By grounding SPS interventions in the lived realities of women and men along the cowpea value chain, and by deliberately engaging men to shift norms around women's mobility, participation in training, and control over stored grain and income, SPS scaling can avoid exacerbating existing gender inequalities. Applying project findings to

refine training schedules, venues and facilitation approaches, including greater use of female lead trainers, further strengthens the inclusiveness and effectiveness of SPS compliance efforts.

To ensure inclusive access to information and training, projects should:

- Co-design and deliver all SPS training through decentralized, community-level forums such as local farmers' associations and women's cooperative/market groups, using visual, low-literacy tools and local languages.
- Mandate and schedule separate training sessions for women at times that accommodate their dual burdens (e.g., late afternoons or school holidays), and hold them in accessible, community-based locations to mitigate mobility barriers.
- **Project Action:** Leveraging the Revised National Gender Policy in Agriculture and its Strategic Action Plan (2025–2030) and the National Agricultural Extension Policy (NAEP, 2023) mandate for inclusive service delivery and gender-sensitive programming, the project can train volunteer women lead farmers as compliance advisers, risk communicators, and champions to decentralize SPS training at community level to complement State ADP efforts in Benue and Nasarawa. The NAEP explicitly calls for decentralized, demand-driven extension that ensures support for women, youth, and other underserved groups, while also promoting public-private collaboration and pluralistic service delivery. To operationalize this mandate, the project can partner with institution such as Sasakawa Africa Association (SAA) Nigeria formerly Sasakawa Global 2000—which has a long-standing track record of strengthening extension systems and conducting practical, field-tested training across multiple value chains. SAA Nigeria has implemented demonstration plots featuring improved cowpea varieties such as SAMPEA 11, with documented yield gains from 0.6 MT/ha to 2.5 MT/ha for cowpea through a combined approach of input supply, hands-on training, and field-based learning. The association also works directly with State ADPs, having, for instance, distributed plastic tables, chairs, moisture meters, and other support items to women's cooperatives and extension service delivery points in Niger State. Through this partnership, the project can focus on conducting pre-season Training-of-Trainers (ToT) programmes (SAA has recently trained 116 frontline extension agents across intervention states), and co-designing gender-sensitive training and risk communication materials, knowledge resources all aligned with the project interventions, NAEP's framework and SAA's proven farmer-centric methodology.
- The project's focus on SPS compliance directly complements the Food Safety for Africa (FS4Africa's Use Case 2 (UC2)<sup>8</sup>, a dedicated workstream actively tackling the challenge of high pesticide residues in staple crops, including cowpea. The FS4Africa is a four-year, EU-funded Horizon Europe project (2024–2027) dedicated to revolutionizing food safety systems across the continent, targeting countries such as Nigeria and Ghana in west Africa, with a particular focus on the vital yet underserved informal sector and actors. Led by a consortium of experts from Africa and Europe, the project employs an interdisciplinary, multi-actor approach to co-design, implement, test, and evaluate innovative solutions. Through a coordinated

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<sup>8</sup> FS4Africa (Food Safety for Africa). (2024–2027). FS4Africa Project Fact Sheet. Horizon Europe (Grant Agreement ID: 101136916). European Commission. <https://cordis.europa.eu/project/id/101136916>

collaboration on co-designing communication materials and evidence-informed training resources such as 'safe cowpea' handbook, pre-recorded video and audio lessons, poster, community drama and role-play stories, that can be performed by local groups to dramatize the health and economic consequences of poor practices and the benefits of compliance, making the message culturally resonant, the project can effectively educate farmers on pesticide Maximum Residue Limits (MRLs), raise awareness about the health and economic benefits of safe practices, and promote the adoption of Good Agricultural Practices (GAP) and alternative solutions such as hermetic storage bags. By leveraging FS4Africa's promotion of good practices, this partnership can ensure a wider reach to actors and stakeholders and a unified, impactful approach to reducing the double-dosing of pesticides observed in major cowpea-producing states in Nigeria.

- Instead of creating new structures, embed SPS training into the regular meetings of existing women's farmers groups, traders' unions, self-help groups, village savings and loan associations (VSLAs), and cooperative societies.
- Develop and promote market-based incentives that reward safe practices, such as creating direct linkages between women's producer groups and buyers (including exporters) seeking verified, low-residue cowpea.
- Actively promote and facilitate access to affordable, chemical-free storage technologies (like PICS bags)
- Create a "Certified Safe Cowpea" Brand: Develop a simple, recognizable logo for bags of cowpea that meet SPS standards. This logo can be used on packaging and in the market, creating a market incentive for compliance.
- Drawing on the APP (2015–2020), the ERGP, and the NGPA (2025–2030), the Benefit pillar requires developing incentive structures that explicitly recognize and reward women's quality-critical labor in cowpea — the shelling, sorting, winnowing, and cleaning that directly determine whether cowpea meets MRL standards. A premium payment scheme for low-residue, verified cowpea open to all suppliers meeting quality standards, with targeted support to enable women's groups to participate, would serve as a valuable complementary incentive.
- Women-led aggregation should be actively supported and cooperatives linked to NEPC export channels and the FMAD/NWAPDI Sovereign AgroTrade System, whose AgriXchange, AgriCert, and NWAPDI Grow components offer pathways to quality certification and cooperative finance.
- Launch a "SPS Ambassador" Program: Train and certify respected lead farmers, aggregators, traders, especially women—as SPS Ambassadors, export companies. Provide them with a branded vest, a mobile phone loaded with resources, to conduct peer-to-peer training.
- Establish "Model Farms": Partner with women-led farmers and cooperatives to establish "Model Farms" that strictly follow all SPS protocols. These farms become practical laboratories for training, open for other farmers to visit and learn. On-farm processes and activities should be documented using participatory videos techniques so knowledge can be communicated to actors in other states

### Training Topics, Audience Composition, and SPS Focus

The following table aligns training topics with the seasonal calendar, specifies whether sessions should be women-only, men-only, or mixed, and prioritizes SPS compliance and sustainable use of plant protection products (PPPs).

Recommended Topic(s)	Audience Composition	SPS Focus
Post-harvest storage and hermetic bags;	Women-only (morning) + Mixed (afternoon)	Safe storage to reduce pesticide re-application; MRL basics
Land preparation and soil health (men's session)	Men-only	Alternative pest control (IPM) to reduce PPP dependence
Early-season planting – GAP for cowpea	Mixed (men lead, women participate)	Correct pesticide application timing; buffer zones
Integrated Pest Management (IPM)	Mixed	How to identify pests and use biocontrols before spraying
Safe pesticide handling and PPE	Mixed (demonstration)	Reading labels; calculating doses; disposal of containers
No field training – Use pre-recorded audios or videos	Women-only (audio resources)	Double-dosing dangers; pre-harvest intervals (PHIs)
Harvesting and hygiene practices	Women-only (morning sessions)	Preventing cross-contamination during harvest
Drying techniques and aflatoxin prevention	Women-only (evening community meetings)	Proper drying to reduce mold and need for fungicides
Shelling, sorting & storage hygiene	Women-only	Identifying damaged grains; safe storage practices
Market access and MRL certification	Mixed (women + traders)	Linking SPS compliance with premium prices
Record-keeping and traceability for safe cowpea	Mixed (women-led cooperatives)	Simple farm diaries for spraying dates and harvest intervals. Branded sacks for treated and non-treated sacks.

By producing and deploying this mix of materials and strategies, the project can educate on SPS compliance and build a lasting, market-driven culture of food safety.

The data also clearly distinguish between men's and women's aspirations, enabling the project to define relevant, gender-sensitive and responsive impact metrics. Project monitoring and evaluation frameworks must therefore go beyond income growth and asset acquisition to track qualitative and agency-focused indicators, such as reductions in women's time burden, acquisition of processing assets, children's school retention, and improvements in household food security. These indicators better reflect women's specific aspirations, ensure equitable benefit accrual from livelihood improvements, reinforce women's managerial capacities and validate their central contributions to the cowpea value chain.

Overall, the project provides a robust basis for extending the Benue experience to other cowpea hubs in Nigeria. When implemented through intentional gender mainstreaming, such scaling can simultaneously improve SPS compliance, protect consumers, and meaningfully advance gender-equitable livelihoods and agency across cowpea value chains.

The GAPo analysis reveals that policies recognizing gender inequalities rarely include specific measures, budget lines, or accountability mechanisms to address them. Policies with strong gender provisions (NFNP, NEP, NATIP, NGPA, NDAS) provide mandates but require operationalization. Policies without gender provisions (NPFSIS, NPE, Food Safety Bill) create governance gaps that the project must navigate strategically, using its M&E evidence to demonstrate how gender-responsive SPS approaches fill these gaps in practice.

Nigeria has strong gender-responsive agricultural policies (NGPA, NEP, NATIP) but these coexist with gender-blind food safety policies (NPFSIS, NSPRI-FSP) that fail to recognize women as primary food safety actors in the cowpea chain. The implementation gap remains critical: even policies with strong gender provisions suffer from inadequate resources, weak enforcement, and lack of accountability mechanisms. The NGPA's dedicated budget lines from 2026 offer a significant opportunity, but sustained advocacy is required to ensure resources reach women cowpea producers and processors at the community level.

## 6.0 LESSONS LEARNED

### A. Challenges

The initial attempt to gather crucial market data in Otukpo was constrained by an unexpected and sensitive non-project related challenge, highlighting the need for rapid adaptation and empathy in fieldwork. The research team was unable to conduct interviews with the leader and members of the cowpea/beans marketer's association in Otukpo due to a severe and deeply personal trauma experienced by the lead marketer. His indisposition stemmed from an incident during a prior tribal clash, which resulted in the burning of his goods and stalls. The profound emotional impact of this historical event rendered him unable to grant an interview, leading to the polite termination of the market entry at that site.

Non-availability of safe and good accommodation near the communities visited which resulted in about two to three hours' drive every day during the execution of the study.

## **B. Best Practices**

Empathy, respect for personal experience, and non-coercion are paramount in maintaining ethical research standards and ensuring the goodwill of the community, even at the cost of immediate data collection.

Team professionalism approach, respectful and horizontal communication and hospitality resulted in easy divulge of information by the stakeholders interviewed.

Co-planning of the activities along with identifying contact persons to the communities and markets and export company office facilitated easy mobilization and progressive data collection in the communities and markets and companies visited.

The team demonstrated professionalism and adaptability by immediately reassessing the methodology. This resulted in the successful relocation of the essential market discussion to a viable alternative site: the Wadata market in Makurdi. This corrective action ensured the critical data gaps regarding bulk trading, storage practices and market quality standards were elicited, allowing the mission objectives to be met without compromising ethical engagement

## **C. The Next Phase of the Project Should Address Identified Gaps**

**The Data Gap:** Few policies require sex-disaggregated data collection or gender analysis in M&E systems. Without data, gender gaps remain invisible.

The project has documented the gender analysis and value chain development of cowpea in Nigeria; findings are currently informing a communication campaign and trainings. Project next steps should continue to track sex-disaggregated participation in all training activities; measure gender-differentiated outcomes; document women's control over benefits; and share this data with policymakers to demonstrate the value of sex-disaggregated data. Specifically, this data should be shared with: FMAFS's Gender Unit, which is responsible for NGPA (2025–2030) implementation and requires sex-disaggregated value chain evidence for its national reporting framework; NAFDAC and NSPRI, whose food safety policies are due for performance review and where project data on women's exclusion from SPS compliance support can directly inform revision processes; state ADPs in Benue, Nasarawa, and Kano, where evidence on gender gaps in extension reach can justify reallocation of staffing toward women-majority post-harvest communities; and WTO/STDF Project 845 implementing partners, who are currently designing SPS compliance training without sex-disaggregated targeting.

**The Extension Challenge:** The NEP provides a strong gender-responsive framework, but extension services on the ground are collapsed and under-resourced. Farmers report receiving no formal training on safe pesticide storage or PICS bag use; information comes almost exclusively from agro-dealers and peers.

The project should document its training approach — including community-based farmers, processors, and marketer associations in sessions — and share this gender-responsive extension model with state extension

services. Priority communities and associations to include in project activities are: in Benue State, women's farmer and processor groups in Otukpo, Oju, Agatu, and Makurdi LGAs, and women's cooperatives affiliated with the IFAD VCDP programme; in Nasarawa State, women's groups in Lafia, Doma, Obi, and Keana LGAs and women marketers' associations in Lafia central market; and in Kano State, women retail traders and processors at Dawanau market, engaged through the Kano ADP gender desk and existing women's trade associations. As an example of a gender-responsive extension model, the project's SPS compliance training approach combines five elements: (i) female community facilitators recruited from within target LGAs and trained as local food safety advisers; (ii) training scheduled around women's labour cycles — Tuesday to Thursday, 8:00–11:00am in northern states and Monday to Wednesday, 8:00am–12:00pm in Middle Belt states; (iii) venues selected for women's accessibility — processing centres and cooperative storage facilities rather than ADP offices; (iv) pictorial, local-language materials on pesticide selection, PICS bag use, and double-dosing risks; and (v) women's farmer, processor, and marketer associations used as primary entry points. This model should be packaged as a technical note and shared formally with Benue and Nasarawa ADPs and with FMAFS's extension directorate.

#### **The Intersectionality Opportunity: Policies recognize intersectionality (NFNP, NEP, NATIP, NGPA).**

Use evidence from the cowpea study to inform the development of a Gender Integration Strategy and Action Plan (GISAP) that advocates for intersectional approaches in policy implementation. An intersectional approach means disaggregating not only by sex but by variables such as age, literacy, land tenure, location, and marital status that determine which women are actually reached by any given intervention. For cowpea SPS compliance, this matters because the women most responsible for post-harvest practices causing MRL non-compliance — through double-dosing and unsafe storage — are disproportionately older, low-literacy, land-insecure women in remote communities: precisely those least reached by gender-neutral programmes. GISAP should be developed as a next-phase deliverable, drawing on the cowpea and sesame studies and GAPo findings, and submitted to FMARD's Gender Unit as a contribution to NGPA implementation planning.

#### **Policy Reform Window**

Use evidence from the cowpea study to advocate for food safety policy reform, specifically requesting gender-responsive provisions that address documented barriers to women's access to IPM training and SPS compliance support. The three most critical policy targets are: (i) the NSPRI-FSP (2024–2030), which should be revised to recognize women as primary users of storage technologies and targets for post-harvest training, including PICS bag promotion; (ii) the Revised NPFSIS (2024), which should include value chain coordination provisions to address the double-dosing crisis by requiring that chemically treated grain be clearly identified along the supply chain; and (iii) the NEP (2017), whose mandate for gender-responsive extension scheduling and female extension agent deployment should be operationalized through concrete ADP performance indicators.

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## 8.0 ANNEXES

### WOMEN – COWPEA VALUE CHAIN

List of Women Cowpea Farmers who participated in the (FGD) conducted on December 1, 2025 at Ugbokolo Community, Benue state.

SN	First Name	Last Name	Gender	Age	VC Category	Country	Guide/ Tool	Location
1	Oboyi	Pasing	Woman	52	Cowpea Farmer	NG	FGD	Ugbokolo community
2	Abba	Cecilia	Woman	60	Cowpea Farmer	NG	FGD	Ugbokolo community
3	Adegu	Mary	Woman	50	Cowpea Farmer	NG	FGD	Ugbokolo community
4	Agwu	Angela	Woman	58	Cowpea Farmer	NG	FGD	Ugbokolo community
5	Gtol	Patience	Woman	27	Cowpea Farmer	NG	FGD	Ugbokolo community
6	Ochigbo	Debora	Woman	24	Cowpea Farmer	NG	FGD	Ugbokolo community
7	Ojojo	Paulina	Woman	52	Cowpea Farmer	NG	FGD	Ugbokolo community
8	Ezumbi	Juliet	Woman	47	Cowpea Farmer	NG	FGD	Ugbokolo community

List of Women Cowpea Traders who participated in the (FGD) conducted on December 2, 2025 at Ugbokolo Community, Benue state

SN	First Name	Last Name	Gender	Age	VC Category	Country	Guide/	Location
							Tool	
1	Okudu	Cecilia	Woman	55	Cowpea Trader	NG	FGD	Ugbokolo community
2	Ladi	Ameh	Woman	22	Cowpea Trader	NG	FGD	Ugbokolo community
3	Glory	Peter	Woman	30	Cowpea Trader	NG	FGD	Ugbokolo community
4	Ochefija	Ali	Woman	35	Cowpea Trader	NG	FGD	Ugbokolo community
5	Rose	Abah	Woman	75	Cowpea Trader	NG	FGD	Market square
6	Regina	Adja	Woman	31	Cowpea Trader	NG	FGD	Ugbokolo community
7	Favour	Okwon	Woman	20	Cowpea Trader	NG	FGD	Market square

8	Hope	Adakah	Woman	53	Cowpea Trader	NG	FGD	Ugbokolo community
9	Patience	Onah	Woman	30	Cowpea Trader	NG	FGD	Market square
10	Esther	Daniel	Woman	40	Cowpea Trader	NG	FGD	Ugbokolo community
11	Janet	Sunday	Woman	32	Cowpea Trader	NG	FGD	Market square
12	Felicia	Godwin	Woman	48	Cowpea Trader	NG	FGD	Ugbokolo community
13	Grace	Ekola	Woman	15	Cowpea Trader	NG	FGD	Market square
14	Sadikatu	Obaisa	Woman	50	Cowpea Trader	NG	FGD	Market
15	Amina	Mohamed	Woman	46	Cowpea Trader	NG	FGD	Makurdi
16	Umi	Salisu	Woman	48	Cowpea Trader	NG	FGD	Makurdi

### MEN – COWPEA VALUE CHAIN

List of Men Cowpea farmers who participated in the (FGD) conducted on December 1, 2025 at Ugbokolo Community, Benue state

SN	First Name	Last Name	Gender	Age	VC Category	Country	Guide/	Location
							Tool	
1	Oboyi	Matthew	Man	45	Cowpea Farmer	NG	FGD	Ugbokolo
2	Agomu	Augustine	Man	50	Cowpea Farmer	NG	FGD	Ugbokolo
3	Oloja	Sunday	Man	40	Cowpea Farmer	NG	FGD	Ugbokolo
4	Abba	Thaddeus	Man	50	Cowpea Farmer	NG	FGD	Ugbokolo
5	Abba	Benoval	Man	48	Cowpea Farmer	NG	FGD	Ugbokolo
6	Abba	Peter	Man	40	Cowpea Farmer	NG	FGD	Ugbokolo
7	Ejoha	Simon	Man	50	Cowpea Farmer	NG	FGD	Ugbokolo
8	Ogwuche	Patrick	Man	40	Cowpea Farmer	NG	FGD	Ugbokolo
9	Adah	Anthony	Man	50	Cowpea Farmer	NG	FGD	Ugbokolo
10	Amodu	Jerry	Man	35	Cowpea Farmer	NG	FGD	Ugbokolo
11	Oboyi	Gabriel	Man	30	Cowpea Farmer	NG	FGD	Ugbokolo

List of Men cowpea traders who participated in the (FGD) conducted on December 5, 2025 at Wadata Market, North-Bridge Area, Makurdi, Benue state

SN	First Name	Last Name	Gender	Age	VC	Country	Guide/	Location
					Category		Tool	
1	Muritala	Dauda	Man	45	Cowpea Trader	NG	FGD	Makurdi Wadata
2	Mohammed	Adamu	Man	30	Cowpea Trader	NG	FGD	Market
3	Abubakar	Ibrahim	Man	30	Cowpea Trader	NG	FGD	Wadata
4	Issa	Abdulahi	Man	27	Cowpea Trader	NG	FGD	Market
5	Umar	Isiaka	Man	42	Cowpea Trader	NG	FGD	Wadata
6	Ibrahim	Jiguda	Man	48	Cowpea Trader	NG	FGD	Market
7	Saidu	Umar	Man	56	Cowpea Trader	NG	FGD	Wadata
8	Awolu	Tanko	Man	41	Cowpea Trader	NG	FGD	Makurdi
9	Ibrahim	Tanko	Man	54	Cowpea Trader	NG	FGD	Makurdi
10	Jubril	Abdulahi	Man	52	Cowpea Trader	NG	FGD	Makurdi
11	Samuel	Aujivin	Man	55	Cowpea Trader	NG	FGD	Makurdi

#### Scanned Participants List



FGD and KII  
Stakeholders\_Actors

Data collection tools is the same as Sesame.

## 9.0 PHOTO GALLERY



Men Cowpea Farmers FGD session in Ugbokolo Community, Okpokwu LGA in Benue State



Women Cowpea Farmers FGD session in Ugbokolo Community, Okpokwu LGA in Benue State



Women Cowpea-Beans Marketers Group photo after FGD session in Ugbokolo Community, Okpokwu LGA in Benue State



Cowpea-Beans Marketers FGD Participant in her stall in Ugbokolo market square, Okpokwu LGA in Benue State



Cowpea on display inside North-west market, Makurdi, Benue state



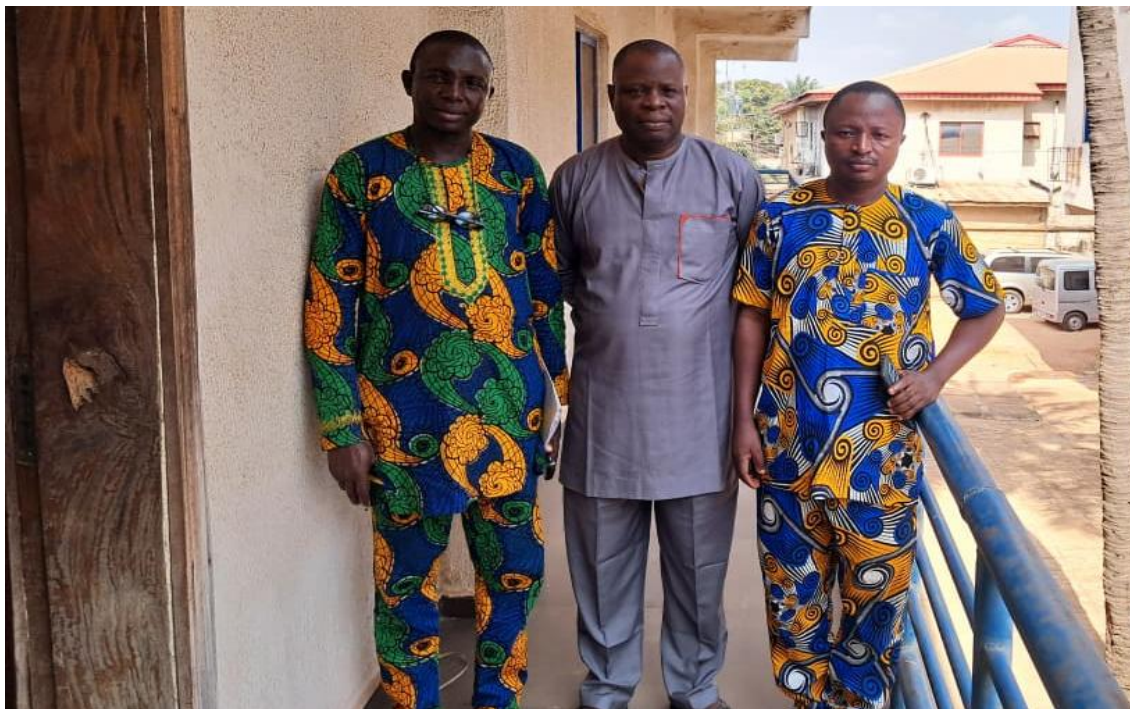
KII with cowpea-bean lead farmer in Ugbooko community in Okpokwu LGA in Benue State



Group photo with the Chief of Otukpo and Extension Officer after KII sessions in in Benue State



Diverse cowpea-beans varieties released from research institute in Nigeria



KII with a Manager in OLAMS Company in Makurdi in Benue State



A



B

A - Standard beans storage bag on display – Not available in the rural communities -  
B - Empty bottles of agri-chemicals (insecticides) used in the preservation of cowpea and sesame



A



B

A - Empty bottles of agri-chemicals (insecticides) with precaution instructions  
 B- Empty bottles of agri-chemicals (insecticides) with usage instructions