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Climate-Smart but Ecology-Blind: Assessing Agroecological Integration in Ghana's Feed Ghana Program

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Research Article

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Abstract

Ghana's Feed Ghana Program (FGP, 2025–2028) sits at a genuinely difficult intersection: it takes climate resilience seriously but treats ecology as someone else's problem. The program endorses climate-smart agriculture, distributes drought-tolerant varieties, and pilots water-saving techniques for rice; all credible steps. What it does not do is engage with the agroecological principles that actually determine whether farming systems can absorb shocks over the long run: biodiversity, nutrient cycling, farmer-led knowledge creation, indigenous seed sovereignty, ecological land management. That silence matters, and not just ecologically. The knowledge systems the FGP sidelines such as seed networks, intercropping arrangements, and organic matter management are disproportionately held by women farmers. Designing them out of the program is, in practice, designing women's expertise out of it too. This article evaluates the FGP's agroecological integration through an ecofeminist lens, drawing on systematic policy analysis, focus group discussions with smallholder women farmers, key informant interviews with program and agricultural ecology experts, and benchmarking against six international frameworks. The central finding that the FGP is climate-smart but ecology-blind is developed alongside a new theoretical concept: 'gender-agroecology disjuncture,' which names the structural gap between a program's formal gender inclusion commitments and its ecological design choices. The article closes with specific, operationally grounded recommendations for addressing this disjuncture in the FGP's ongoing development.

1. Introduction

There is a finding in the literature on sub-Saharan African agriculture that deserves more attention than it gets: the ecological knowledge most critical to long-term food system sustainability (seed stewardship, biodiversity management, adaptive farming innovation) is disproportionately held by women (Bezner Kerr et al., 2021; Schiavoni, 2022; Twyman et al., 2023). This is not incidental. Women across West Africa are the primary custodians of household food security, seed diversity, and natural resource management in rural communities, roles that have generated genuinely specialized ecological expertise over generations (Asante et al., 2023; Nyantakyi-Frimpong, 2022). The implication is both theoretically pointed and practically urgent: agricultural programs that ignore gender in their agroecological design do not just shortchange women farmers. They hollow out the ecological knowledge base that genuine climate resilience depends on.

the Feed Ghana Program (FGP, 2025–2028), launched by the Ministry of Food and Agriculture (MoFA) in May 2025, is a useful test case for this proposition. The FGP's climate adaptation provisions are real: climate-smart agriculture (CSA) is mainstreamed across sub-programs, drought-tolerant varieties are distributed, Alternate Wetting and Drying (AWD) is introduced for rice, and digital weather advisory services are proposed for smallholder farmers. These are not cosmetic interventions. But the program's deeper logic is productivity-first and input-intensive: hybrid seed adoption, synthetic fertilizer distribution, mechanization, large-scale irrigation. The agroecological principles that define contemporary sustainability frameworks such as biodiversity enhancement, nutrient cycling, farmer-led knowledge

creation, indigenous seed sovereignty, ecological land management, and social equity, are largely absent from the design (HLPE, 2019; Wezel et al., 2020). The result is a program that is technically adaptive at the farm level but structurally unable to deliver the systemic ecological transformation that genuine climate resilience requires.

That ecology blindness has gendered costs that the development literature has not yet named precisely. The indigenous seed systems, intercropping arrangements, organic matter management practices, and biodiversity-oriented land management that agroecological programs need to build on are the forms of knowledge that women in Ghana hold most abundantly (Bezner Kerr et al., 2021; Nyantakyi-Frimpong, 2022; Schiavoni, 2022). A program that treats these knowledge systems as irrelevant simultaneously treats women's agricultural expertise as irrelevant. The FGP's ecology blindness is not a neutral technical choice; it is a decision with real and predictable consequences for who benefits from the program and whose knowledge shapes it.

This article develops the concept of 'gender-agroecology disjuncture' to describe this dynamic: the structural gap between a program's formal gender inclusion commitments and its ecological design choices. The FGP nominates women as priority beneficiaries and sets a fifty percent women's participation target in training. These commitments exist in the documentation. What they do not do is engage with the ecological dimensions of agriculture where women's knowledge is most consequential; and that omission is precisely what the disjuncture concept is designed to identify and analyze.

The article makes four contributions. It provides an empirically grounded evaluation of the FGP's agroecological integration, filling a gap in peer-reviewed assessment of the program's ecological design. It develops the gender-agroecology disjuncture concept as a tool for analyzing the structural relationship between gender inclusion and ecological program design, contributing to the gender-transformative agroecology literature (Bezner Kerr et al., 2021; Schiavoni, 2022; Twyman et al., 2023). It applies an ecofeminist analytical framework that integrates feminist analysis of power relations with political ecology's attention to ecological governance. And it generates operationally specific recommendations for integrating agroecological principles and gender equity simultaneously within the FGP.

The article proceeds as follows. Section 2 reviews the literature on agroecology, gender, and climate resilience, developing the ecofeminist framework and the gender-agroecology disjuncture concept. Section 3 describes the methodology. Section 4 presents findings across six agroecological dimensions, the FGP's climate adaptation provisions, and their gendered implications. Section 5 discusses the disjuncture dynamic and its implications for program reform. Section 6 concludes with recommendations.

2. Theoretical Framework and Literature Review

2.1 Agroecology: Principles, Science, and Social Movement

Agroecology has been described as a science, a practice, and a social movement, and its scope has expanded considerably over two decades from a relatively narrow agronomic framework to a comprehensive approach for transforming food systems (Gliessman, 2015, as cited in Wezel et al., 2020; HLPE, 2019). As a science, it applies ecological principles to agricultural systems: biodiversity at genetic, species, and ecosystem levels; the recycling of nutrients and energy within farming systems rather than importing them from external sources; the management of ecological processes like pest regulation, pollination, and water regulation through habitat design and biological diversity rather than synthetic inputs; and the integration of crops, livestock, trees, and aquatic components in complex, resilient farming systems (HLPE, 2019; Wezel et al., 2020). As a political project, agroecology encompasses commitments to food sovereignty, farmer agency, horizontal knowledge exchange, and social equity (including gender equity) as prerequisites for sustainable food system transformation (Schiavoni, 2022; Tittonell, 2023).

The High Level Panel of Experts on Food Security and Nutrition (HLPE, 2019) identifies ten elements of agroecology: diversity, co-creation and sharing of knowledge, synergies, efficiency, recycling, resilience, human and social values, culture and food traditions, responsible governance, and circular and solidarity economy. These are meaningfully different from the narrow set of ‘climate-smart’ practices such as drought-tolerant varieties, conservation agriculture, climate information services that dominate agricultural development investment in Ghana and across sub-Saharan Africa. Climate-smart agriculture (CSA), as defined by FAO and operationalized in national programs, addresses farm-level adaptation to climate variability but does not require the systemic ecological redesign that agroecology demands (Ampaire et al., 2022; Descheemaeker et al., 2023). That distinction is not semantic. CSA can be implemented within input-intensive, monoculture-oriented production systems without any of the biodiversity enhancement, nutrient cycling, or farmer-led innovation that constitute the core of agroecological practice.

Recent scholarship has increasingly questioned whether CSA as currently practiced in sub-Saharan Africa constitutes a genuine pathway to climate resilience, or a rebranding of conventional agricultural intensification with climate-adaptive features layered on top (Ampaire et al., 2022; Descheemaeker et al., 2023; Tittonell, 2023). Tittonell (2023) argues that CSA without agroecological foundations produces ‘brittle resilience’; short-term adaptive capacity without the ecological robustness needed to survive compounding climate shocks. Descheemaeker et al. (2023) show, through modelling across smallholder systems in sub-Saharan Africa, that productivity gains from CSA practices without agroecological diversification are consistently smaller and less durable than gains from integrated agroecological system redesign. These findings bear directly on the FGP’s climate strategy and provide the evidentiary foundation for this article’s evaluation.

2.2 Ecofeminism, Gender, and Agroecological Knowledge

Ecofeminism, the theoretical tradition that analyzes the domination of women and the domination of nature as mutually reinforcing expressions of patriarchal social order, provides the second pillar of the analytical framework (Mies & Shiva, 1993, as cited in Schiavoni, 2022; Plumwood, 2002, as cited in

Sultana, 2021). Contemporary ecofeminist scholarship has moved well beyond the essentialist early formulations that posited women as naturally closer to nature, toward a structural analysis of how patriarchal economic and institutional arrangements simultaneously exploit women's reproductive and care labor and extract natural resources without accounting for ecological costs (Schiavoni, 2022; Sultana, 2021). In the agricultural context, this structural analysis draws attention to how the same institutional arrangements such as land tenure systems, credit architectures, extension services, and market channels, marginalize women from agricultural development simultaneously and undervalue the ecological knowledge systems and practices that women maintain.

Bezner Kerr et al. (2021), in the most comprehensive recent review of gender and agroecology in sub-Saharan Africa, demonstrate that women farmers across the region are the primary custodians of crop genetic diversity, maintaining substantially more traditional varieties than male farmers and prioritizing criteria such as drought tolerance, pest resistance, taste, storability, and nutritional composition that formal breeding programs systematically undervalue in favor of yield maximization. Nyantakyi-Frimpong (2022), focusing specifically on northern Ghana, documents that women farmers' seed networks (the informal systems through which traditional varieties are shared, exchanged, and maintained across communities) constitute the primary mechanism for preserving crop genetic diversity in an era of accelerating climate variability, and that these networks are systematically excluded from formal agricultural development programming that channels improved seeds through commercial distribution systems.

Schiavoni (2022) develops a 'feminist political agroecology' framework that integrates feminist political economy's attention to the social relations of production and reproduction with agroecology's ecological principles. From this perspective, the FGP's ecology blindness is not merely a design oversight but a political choice that reflects and reproduces the power relations privileging formal, market-oriented, technology-intensive knowledge over informal, relational, ecologically grounded knowledge. The same power relations that sustain women's structural exclusion from agricultural development.

2.3 The Gender-Agroecology Nexus in Contemporary Policy

The nexus between gender equity and agroecological sustainability has attracted increasing attention in the development policy literature since 2020, with growing recognition that gender-transformative approaches are necessary conditions for effective agroecological transition rather than optional equity supplements (Bezner Kerr et al., 2021; Twyman et al., 2023; UN Women & FAO, 2022). Twyman et al. (2023), in a systematic review of gender-transformative approaches in agriculture, find that programs integrating gender equity and agroecological principles achieve substantially better outcomes on both dimensions than programs addressing either in isolation. They attribute this to positive feedback dynamics between women's empowerment, knowledge utilization, and ecological system health. UN Women and FAO (2022) similarly document that women's substantive participation in agricultural

governance is positively associated with greater biodiversity on farms, stronger indigenous seed systems, and more effective natural resource management across sub-Saharan African communities.

Despite this evidence, a persistent gap characterizes the relationship between gender inclusion and ecological design in mainstream agricultural development programs: programs that articulate strong gender commitments typically do not integrate these commitments with agroecological program architecture, while agroecological programs frequently neglect gender equity dimensions (Schiavoni, 2022; Twyman et al., 2023). This is not simply a coordination failure. It reflects the different institutional genealogies and political constituencies of gender programming and agroecological advocacy, which have developed largely in parallel within development institutions without systematic integration at the program design level (Bezner Kerr et al., 2021; Nyantakyi-Frimpong, 2022).

The gender-agroecology disjuncture concept, developed in this article, provides a theoretical tool for analyzing this structural gap with precision. Disjuncture, in this framework, describes not merely the co-occurrence of gender inclusion and ecological exclusion within the same program, but the structural relationship between them: a program's decision to design around input-intensive, technology-transfer agricultural models is simultaneously a decision to marginalize the ecological knowledge systems through which women exercise distinctive agricultural agency. Gender-agroecology disjuncture is a form of structural gender discrimination embedded in ecological program design choices; not a deliberate exclusion, but a structural consequence of design orientations that systematically privilege formal, technology-intensive knowledge over informal, ecologically grounded knowledge.

2.4 Agroecology and Climate Resilience in West Africa

The evidence on agroecological approaches to climate resilience in West Africa has grown substantially in recent years. Descheemaeker et al. (2023) demonstrate that integrated agroecological farming systems combining crop diversity, soil organic matter management, water harvesting, and integrated pest management achieve significantly greater resilience to drought and rainfall variability than CSA-only approaches in semi-arid and sub-humid West African contexts comparable to northern Ghana. Asante et al. (2023) document that climate-vulnerable smallholder farmers in Ghana who employ greater crop diversity, including traditional variety mixtures, experience more stable yields across variable years than those relying on improved monoculture varieties, even when those varieties are drought-tolerant.

Nyantakyi-Frimpong (2022) shows that women farmers' seed networks in northern Ghana function as informal climate adaptation systems, distributing seed varieties with differential drought tolerance, maturity periods, and pest resistance across communities in response to observed climate variability. This is an adaptive governance function that formal seed distribution through certified commercial channels cannot replicate. Laso Bayas et al. (2023) document that digital agricultural advisory services; central to the FGP's climate information provisions, reach male farmers more effectively than women in West African contexts, given differential mobile phone access, literacy levels, and time availability. This finding directly challenges the assumed gender-neutrality of the FGP's digital CSA provisions.

Together, this literature establishes a clear argument: climate resilience in Ghana's agricultural sector requires ecological system redesign rooted in agroecological principles and women's knowledge, not merely the technical climate adaptation measures that the FGP currently embeds in its input-intensive, productivity-first framework.

3. Methodology

3.1 Research Philosophy and Design

This study adopts an ecofeminist pragmatist research philosophy (Mertens, 2022; Schiavoni, 2022), combining the ecofeminist framework described in Section 2 with pragmatism's commitment to abductive reasoning and practical utility. The approach reflects the dual demands of the research: to generate theoretical knowledge about the gender-agroecology disjuncture and to produce findings that are useful for program reform and advocacy. The feminist inflection, drawing on ActionAid International's Feminist Research Guidelines and recent elaborations of feminist research methodology in agricultural development contexts (Mertens, 2022; Twyman et al., 2023), centers women's ecological knowledge and lived experience as primary epistemic resources rather than treating them as data to be extracted and interpreted through external frameworks.

The ecofeminist pragmatist approach was chosen for three reasons: its capacity to integrate analysis of gender power relations with ecological systems analysis (Schiavoni, 2022); its attention to indigenous and informal knowledge systems as legitimate sources of agricultural intelligence (Bezner Kerr et al., 2021; Nyantakyi-Frimpong, 2022); and its commitment to practically useful knowledge without sacrificing theoretical rigour (Mertens, 2022). A cross-sectional mixed methods design was employed, enabling simultaneous data collection across multiple sources. Research strategies included systematic policy analysis, case study, and reflexive thematic analysis (Braun & Clarke, 2021).

3.2 Data Collection

Primary data were collected through two principal methods. Focus group discussions (FGDs) were conducted with smallholder women farmers directly engaged with ActionAid Ghana's Country Strategy Paper (CSP) VII (2023–2028) activities. Consistent with ecofeminist research principles, FGD design prioritized participants' articulation of their own ecological knowledge and farming practices, using open and participatory questioning techniques. Questions addressed seed systems, soil management practices, intercropping arrangements, water conservation techniques, pest management knowledge, and participants' experiences of climate variability and adaptation.

Key informant interviews (KIIs) were conducted with a purposively selected range of stakeholders: Ministry of Food and Agriculture (MoFA) program and extension officers, agricultural ecologists from the Council for Scientific and Industrial Research (CSIR) and university departments, civil society representatives engaged in agroecological programming, field agronomists, seed system specialists, and women's cooperative leaders with expertise in traditional variety management. This range enabled

triangulation across institutional, scientific, and community-based perspectives on the FGP's design and its gender implications.

Secondary data collection involved systematic review of the FGP policy document (final draft), Ghana's National Climate Change Policy, ActionAid Ghana's Country Strategy Paper (CSP) VII, Vision 2057 (NDPC, 2024), and relevant international frameworks including the HLPE (2019) agroecology report, FAO's Gender and Agrifood Systems Program (FAO, 2023), the CGIAR Gender Program strategy (CGIAR Gender Program, 2022), and the Wezel et al. (2020) agroecology principles framework. Content analysis of the FGP document used a structured coding framework derived from the HLPE's ten agroecological elements, producing a systematic mapping of which elements are present, partially present, or absent from the program design.

3.3 Analysis and Validation

FGD and KII transcripts were subjected to reflexive thematic analysis following Braun and Clarke (2021), generating themes inductively from participants' accounts, then mapping these themes deductively against the agroecological principles framework and the gender-agroecology disjuncture concept. Policy analysis produced a scored assessment of the FGP's integration of each of the ten HLPE agroecological elements, distinguishing between rhetorical acknowledgement, partial operational integration, and systemic embedding. A stakeholder validation workshop enabled women farmers, program officials, and agricultural ecology experts to contest, refine, and confirm the analytical conclusions; two significant analytical refinements emerged from this process.

3.4 Positionality, Ethics, and Limitations

The study was conducted in accordance with ActionAid International's Feminist Research Guidelines and ActionAid Ghana's institutional ethics protocols. Informed consent was obtained from all participants prior to data collection. The ecofeminist orientation reflects deliberate normative commitments to gender equity and ecological sustainability that shape the analytical framework and conclusions; readers should engage with findings with awareness of this positionality (Mertens, 2022; Schiavoni, 2022). Methodological limitations include the prospective nature of the analysis (based on FGP draft documentation rather than implementation evidence), potential selection effects from sampling within ActionAid Ghana's program communities, and the cross-sectional design's limitation of longitudinal assessment. The study's multi-method design, systematic agroecological element assessment, and expert validation provide a robust analytical foundation notwithstanding these constraints.

4. Findings

4.1 FGP's Climate Adaptation Provisions: Credible but Farm-Centric

The FGP's climate adaptation provisions are genuinely substantive. Climate-Smart Agriculture is embedded as a cross-cutting principle across crop and vegetable sub-programs, with specific provisions for drought-tolerant and climate-resilient varieties of maize, sorghum, and soyabean developed through formal plant breeding and distributed through the Farmers' Service Center (FSC) network. Alternate Wetting and Drying (AWD) for rice production is identified as a water conservation measure with co-benefits in methane emission reduction. An Environmental and Social Management Framework (ESMF) with site-specific Management Plans establishes basic environmental safeguards. Digital weather forecasting and local-language advisory services are proposed as mechanisms for improving climate information access among smallholders.

Key informant interviews with agricultural scientists at CSIR confirmed that these provisions are technically sound and represent meaningful progress relative to predecessor programs where climate adaptation was not robust at the sub-program design level. Participants with extension system expertise noted that the integration of weather advisory services with extension delivery, while not yet operationally specified, represented a potentially significant improvement in climate information access for farmers in vulnerable areas. But the same participants consistently identified a critical limitation: these provisions address farm-level vulnerability to climate variability without engaging with the systemic ecological dimensions of climate resilience such as biodiversity, nutrient cycling, landscape-level water management, and farmer-led adaptive innovation that determine whether farming systems can absorb and recover from compounding climate shocks over time.

The conceptual distinction KII participants drew between farm-level adaptation and systemic resilience maps precisely onto Tittonell's (2023) distinction between 'brittle resilience', that is, short-term adaptive capacity achieved through technical interventions without systemic ecological foundations; and 'robust resilience' achieved through agroecological system redesign. The FGP's climate adaptation provisions, credible as they are, remain within the brittle resilience paradigm: they improve farmers' capacity to manage individual climate events without building the systemic ecological diversity, recycling, and adaptive governance that would enable farming systems to absorb the compounding, unpredictable shocks that characterize West Africa's climate future.

4.2 Agroecological Integration: A Systematic Element Assessment

The systematic assessment of the FGP's integration of the HLPE's ten agroecological elements reveals a consistent pattern: the program incorporates selected agroecology-adjacent practices within a fundamentally input-intensive framework, while leaving the core principles that distinguish agroecology from conventional CSA entirely unaddressed. Table 1 presents the full element-by-element assessment.

Table 1
Assessment of FGP Integration of HLPE (2019) Agroecological Elements

Agroecological Element	Description	FGP Integration Level	Evidence / Gap
1. Diversity	Crop, livestock, landscape & genetic diversity	Partial	Climate-resilient varieties promoted but hybrid monocultures dominate; no traditional variety integration; no landscape diversity planning (Nyantakyi-Frimpong, 2022)
2. Co-creation & sharing of knowledge	Farmer-led innovation; horizontal knowledge exchange; participatory research	Absent	Top-down extension model; no participatory variety selection; no farmer experimentation provisions (Twyman et al., 2023)
3. Synergies	Crop-livestock integration; agroforestry; intercropping; multi-component systems	Absent	Single-commodity enclave approach; no intercropping, agroforestry, or crop-livestock integration provisions
4. Efficiency	Ecological process efficiency; reduced external input dependency	Weak	FSCs centerd on synthetic input distribution; IPM mentioned but not operationalised with biocontrol pipelines (Descheemaeker et al., 2023)
5. Recycling	Nutrient cycling; composting; on-farm organic matter management	Minimal	ISNM mentioned briefly; no composting systems, biogas, or residue management provisions
6. Resilience	System-level ecological resilience; redundancy; adaptive capacity	Partial (technical)	AWD, resilient varieties, ESMF present; no landscape-level resilience planning; no community adaptive governance (Tittonell, 2023)
7. Human & social values	Social equity; labor rights; gender equity; food sovereignty	Rhetorical	Women named as priority; no binding gender equity mechanisms; care burdens unaddressed (Njuki et al., 2022)
8. Culture & food traditions	Traditional food systems; cultural crop varieties; indigenous practices	Absent	No traditional variety integration; no indigenous farming practice recognition; export commodity focus (Nyantakyi-Frimpong, 2022)
9. Responsible governance	Participatory governance; transparency; accountability; community land rights	Weak	Governance provisions generic; WIAD without authority; no community land governance provisions (Kuusaana et al., 2024)
10. Circular & solidarity	Local food circuits; cooperative markets;	Absent	Commercial market integration emphasis; GCX and NAFCO

Agroecological Element	Description	FGP Integration Level	Evidence / Gap
economy	fair pricing; farmer networks		channels; no cooperative economy provisions

The element-by-element assessment reveals a consistent pattern: the FGP engages partially with agroecological elements that can be incorporated within a conventional CSA framework; diversity through improved varieties; resilience through technical measures; efficiency through IPM references, while being systematically absent from elements that require more fundamental departures from input-intensive development: co-creation of knowledge, synergies, recycling, culture and food traditions, and circular and solidarity economy. Only two of the ten elements receive even partial integration, and both are partial in ways that reflect the program's input-intensive bias: diversity through formal breeding rather than traditional variety integration, and resilience through technical adaptation rather than systemic ecological redesign.

FGD participants confirmed these gaps through their accounts of their own farming practices. Women farmers across all sites described rich intercropping systems; typically combining cereals, legumes, and vegetables within the same plots, maintained specifically for their risk management, nutritional, and ecological benefits. They described traditional variety mixtures combining multiple drought-tolerant and early-maturing types, selected and adapted across years of observing local rainfall variability. They described informal seed networks through which varieties were shared, exchanged, and tested across communities. None of these practices was referenced in the FGP's extension or input provision architecture; all were effectively designed out of the program by its orientation toward single-commodity production through certified improved varieties and synthetic input packages.

4.3 The Gendered Costs of Ecology Blindness

The FGP's marginalization of agroecological principles is not a gender-neutral technical choice. The ecological knowledge systems and farming practices that the program's ecology blindness excludes (traditional seed systems, intercropping arrangements, organic matter management, indigenous pest control knowledge, biodiversity-oriented land management) are disproportionately held and practiced by women farmers in Ghana, as documented by Nyantakyi-Frimpong (2022) in northern Ghana and Bezner Kerr et al. (2021) across sub-Saharan Africa. The FGP's ecology blindness therefore constitutes a structural form of gender discrimination in program design: it designs out the domain of agricultural knowledge and practice in which women exercise their greatest expertise and agency, while designing in a technology-intensive, market-oriented, mechanization-centerd model in which women are systematically disadvantaged by structural barriers in land, credit, and information access.

Four specific gendered costs are documented in the primary data and literature. The exclusion of indigenous seed systems from the FGP's seed distribution architecture which channels certified improved varieties through FSCs using subsidized pricing that makes certified varieties economically competitive with traditional varieties, thus creating incentive structures that erode the traditional variety

networks that women maintain. Nyantakyi-Frimpong (2022) documents this dynamic in northern Ghana, where previous input subsidy programs significantly reduced traditional variety cultivation among program beneficiaries, with disproportionate impacts on women's seed custodianship roles. The absence of intercropping and multi-component farming systems from extension recommendations removes the farming strategies through which women farmers manage household food diversity, seasonal labor distribution, and ecological risk simultaneously. The absence of composting, organic matter management, and closed-loop nutrient cycling provisions removes practices in which women's labor contributions are greatest and through which women exercise primary management authority on many smallholder farms. And the program's commercial market orientation toward certified markets, formal contracts, and export commodity chains is structurally less accessible to women who manage smaller, more diverse, less formally documented production systems; precisely the systems that agroecological integration would strengthen.

KII data from agricultural ecologists provided expert confirmation. One CSIR scientist described the FGP's seed provision architecture as a system for replacing diversity with uniformity, noting that concentrating distribution through FSC channels carrying certified improved varieties would, over time, reduce the genetic diversity of the crop base in program communities. Another ecological expert observed that the program's extension system, oriented toward technology transfer and input application advice, was fundamentally incompatible with the farmer-led observation, experimentation, and adaptation that characterizes effective agroecological practice. These expert assessments, triangulated with FGD data on women's ecological knowledge, confirm that the program's ecology blindness is not merely a missed opportunity but an active process of displacing the ecological intelligence most immediately held by women; and upon which long-term agricultural resilience depends.

4.4 Gender-Agroecology Disjuncture: Evidence and Mechanisms

The analysis confirms the presence of gender-agroecology disjuncture in the FGP: a structural gap between the program's formal gender inclusion commitments and its ecological design choices. Three specific mechanisms through which this disjuncture operates are identified in the data.

The first is epistemic. The FGP's program design embeds a hierarchy of agricultural knowledge that privileges formal, scientifically validated, technically certified knowledge over informal, relationally produced, ecologically grounded knowledge. This hierarchy appears in every dimension of the program architecture: seed systems that privilege certified varieties over traditional varieties, extension systems that privilege technology transfer over farmer experimentation, market integration that privileges formal contracts over cooperative exchange. Women's ecological knowledge; predominantly informal, relational, and ecologically grounded, sits at the excluded end of this hierarchy in every dimension simultaneously.

The second is institutional. The program's service delivery architecture consistently uses criteria such as farm size, land documentation, commercial potential, and formal group registration that advantage male farmers with access to formal resources over women farmers operating primarily through informal

networks. The ecological practices that women maintain such as traditional variety cultivation, intercropping, organic matter management, biodiversity stewardship are not captured by these criteria, making women's ecological contributions invisible to program monitoring and evaluation systems, and their needs invisible to program designers.

The third is economic. The program's commercial market orientation creates incentives that work against agroecological diversity. When certified improved varieties are subsidized and distributed through FSC channels, traditional varieties become economically uncompetitive even for farmers who value their ecological and cultural dimensions. When extension advice consistently recommends single-commodity production oriented toward formal market channels, the multi-crop, multi-species farming systems through which women manage household food security become framed as backward or inefficient rather than as ecologically sophisticated adaptive strategies. Table 2 summarizes the agroecological integration assessment against international standards.

Table 2
FGP Agroecological Integration: Benchmarking Against International Frameworks

Framework / Standard	Assessment	Key Gaps Identified
HLPE (2019) Agroecology Framework (10 elements)	2/10 elements partially integrated; 0/10 fully embedded	Co-creation of knowledge, synergies, recycling, culture, circular economy: all absent; diversity and resilience partial only
Wezel et al. (2020) Agroecological Transition Framework	Input substitution stage only; no redesign or reconnection	FGP addresses substitution (IPM, AWD) but not system redesign; no landscape or food system reconnection
FAO Gender & Agrifood Systems (FAO, 2023)	Partially compliant on climate; non-compliant on agroecology-gender nexus	No recognition of women's ecological knowledge; indigenous seed systems excluded; care burden unaddressed in extension design
Bezner Kerr et al. (2021) Gender-Transformative Agroecology Standards	Non-compliant	Women's seed custodianship, intercropping, organic management, and governance participation all excluded from program design
CGIAR Gender Program (2022) Gender-Responsive Standards	Gender-aware; not gender-responsive on ecological dimensions	Women identified as beneficiaries in training targets but excluded from seed system design, extension content, and market orientation
Descheemaeker et al. (2023) West Africa Resilience Framework	Brittle resilience only	Technical CSA measures without systemic ecological resilience; no landscape diversification; no farmer-led adaptive governance

5. Discussion

5.1 Gender-Agroecology Disjuncture as a Theoretical Contribution

The gender-agroecology disjuncture concept contributes to the gender-transformative agroecology literature in several ways. Most importantly, it identifies the structural rather than incidental relationship between gender exclusion and ecological program design choices, specifying the mechanisms through which epistemic, institutional, and economic dimensions of program architecture simultaneously marginalize women's agency and marginalize agroecological approaches. This structural specificity moves beyond additive analyzes that treat gender mainstreaming and agroecological integration as separate program deficiencies, showing instead their common roots in the same knowledge hierarchies and institutional biases.

The concept also extends Schiavoni's (2022) feminist political agroecology framework by grounding its theoretical claims in the concrete institutional architecture of a specific national program. Schiavoni argues that the exclusion of women's ecological knowledge from agricultural development programs is a political act, not a technical oversight. The gender-agroecology disjuncture concept provides the analytical vocabulary for identifying precisely where and how this act is performed in program design: in seed system choices, extension architectures, market integration strategies, and governance provisions.

The concept also connects with and extends the literature on epistemic injustice in agricultural development (Bezner Kerr et al., 2021; Nyantakyi-Frimpong, 2022). Epistemic injustice; the wrong done to persons in their capacity as knowers, is realized in the FGP not merely through the exclusion of women from training programs, but through the systematic marginalization of the ecological knowledge systems through which women exercise their most consequential agricultural expertise. Addressing this requires not just improving women's access to existing program content, but redesigning program content to incorporate the ecological knowledge dimensions in which women are primary experts.

5.2 Pathways to Ecological Integration: Program Reform Opportunities

The analysis identifies several specific program reform pathways through which the gender-agroecology disjuncture could be addressed within the FGP's ongoing design process. These are ordered from the most immediately actionable to those requiring more fundamental redesign.

The most immediately actionable reform is integrating traditional variety access and community seed systems into the FGP's seed provision architecture alongside certified improved varieties. Nyantakyi-Frimpong (2022) documents that community seed banks in northern Ghana, predominantly organized and managed by women, have successfully maintained traditional variety diversity while providing verified access for program beneficiaries, and that linking these banks to formal FSC networks can improve reach without displacing informal seed governance structures. ActionAid Ghana's existing programming in seed sovereignty provides a model and advocacy platform for this integration.

The next pathway is redesigning extension content and delivery to incorporate farmer-led agroecological knowledge alongside technology transfer. Bezner Kerr et al. (2021) demonstrate that Farmer Field Schools and participatory variety selection processes; where farmers systematically observe, compare, and evaluate different varieties and farming approaches on their own land, generate substantially greater knowledge uptake and innovation adaptation than technology-transfer extension models, and that these approaches are particularly effective in engaging women farmers whose knowledge is most relevant to multi-crop, diversity-oriented farming systems. Lamie et al. (2024) provide evidence specific to Ghana that gender-responsive extension redesign, including flexible scheduling, community-based delivery, and farmer experimentation support, significantly increases women's extension uptake.

The third pathway is integrating intercropping, agroforestry, and nutrient cycling provisions into FSC service portfolios alongside the synthetic input packages that currently dominate. Descheemaeker et al. (2023) demonstrate that intercropping cereal-legume combinations; the most common traditional farming system in northern Ghana, provides soil nitrogen fixation, weed suppression, and yield stability benefits that substantially reduce synthetic fertilizer requirements while also improving household food diversity and risk management. Integrating technical support for these established farming systems into FSC service provision would both strengthen their ecological foundations and explicitly value the farming knowledge through which women currently manage them.

The final, most fundamental pathway is establishing gender-disaggregated agroecological monitoring within the FGP's Results Framework. Current evidence on gender and agroecology in sub-Saharan Africa is substantially limited by the absence of sex-disaggregated data on agroecological farming practices, traditional variety cultivation, seed network participation, and organic matter management (Bezner Kerr et al., 2021; Twyman et al., 2023). Building these metrics into the FGP's monitoring architecture would improve program evidence and create institutional visibility for women's ecological contributions; visibility that is a prerequisite for the advocacy necessary to secure their recognition in program design.

5.3 Implications for ActionAid Ghana's Advocacy Strategy

The gender-agroecology disjuncture analysis generates specific and actionable implications for ActionAid Ghana's advocacy engagement with the FGP. The organization's dual mandate of advancing gender equity and promoting agroecological, climate-resilient agriculture through CSP VII positions it to advocate for the integration of these commitments within the FGP's design, linking gender inclusion arguments to ecological sustainability evidence in ways that neither gender advocates nor agroecology advocates working in isolation can achieve.

The most strategically significant advocacy opportunity is the FGP's incomplete Results Framework. The program's acknowledgement that its results framework is 'to be inserted' creates a direct and time-limited window for advocacy to ensure that gender-disaggregated agroecological indicators such as traditional variety cultivation rates, seed network participation, intercropping adoption, organic matter management practices, and women's participation in agricultural governance are embedded as binding monitoring requirements before the framework is finalized. Pereznieto and Taylor (2023) document that

CSO advocacy on monitoring frameworks is most effective when conducted early in program design processes and when it presents specific, evidence-based indicator proposals rather than general equity demands.

The second advocacy opportunity is the FGP's ongoing FSC development and training content design. Engaging with MoFA's extension planning processes to advocate for the inclusion of agroecological content such as intercropping recommendations, traditional variety integration, and organic matter management alongside CSA technology transfer, represents a concrete and accessible reform pathway that does not require fundamental program redesign but can substantially shift the balance of program content toward agroecological integration.

6. Conclusions and Recommendations

This article has evaluated the Feed Ghana Program's integration of agroecological principles, developed the concept of gender-agroecology disjuncture as a tool for analyzing the structural relationship between gender inclusion and ecological design, and documented the specific gendered costs of the FGP's ecology blindness. The assessment confirms that the FGP is genuinely climate-smart; its technical adaptation provisions are credible and represent meaningful progress but profoundly ecology-blind: it integrates only two of ten HLPE agroecological elements even partially, leaving the core principles of agroecology such as co-creation of knowledge, synergies, recycling, culture and food traditions, and circular economy entirely absent from its design. This ecology blindness is not gender-neutral; it systematically marginalizes the ecological knowledge systems and farming practices through which women farmers in Ghana exercise their greatest agricultural expertise and agency, constituting a structural form of gender discrimination embedded in ecological design choices.

The gender-agroecology disjuncture concept contributes to the gender-transformative agroecology literature (Bezner Kerr et al., 2021; Schiavoni, 2022; Twyman et al., 2023) by providing theoretical specification of the structural mechanisms through which gender exclusion and ecological marginalization are simultaneously produced in agricultural program design. The concept extends feminist political agroecology (Schiavoni, 2022) by grounding theoretical claims in the concrete institutional architecture of a national flagship program, documenting the epistemic, institutional, and economic mechanisms through which the disjuncture operates, and generating reform pathways that address both dimensions simultaneously.

Six specific recommendations follow from the analysis. Traditional variety access and community seed bank systems (predominantly organized and managed by women) should be integrated into the FGP's seed provision architecture alongside certified improved varieties, establishing a pluralistic seed system that values both formal breeding and community-maintained genetic diversity (Nyantakyi-Frimpong, 2022). Farmer Field Schools and participatory variety selection processes should be incorporated into the FGP's extension delivery architecture, replacing or supplementing the technology-transfer model with approaches that generate farmer-led ecological innovation and explicitly value women's observational

and experimental knowledge (Bezner Kerr et al., 2021; Lamie et al., 2024). Intercropping, agroforestry, and nutrient cycling provisions should be integrated into FSC service portfolios, providing technical support for the diversified farming systems that women currently manage and that provide the ecological foundations for genuine climate resilience (Descheemaeker et al., 2023). The FGP's digital advisory services should be redesigned with gender-responsive delivery mechanisms including voice-based and community relay systems accessible to women with lower literacy and mobile phone ownership, to ensure that climate information provision does not reproduce existing digital gender gaps (Laso Bayas et al., 2023). The FGP's Results Framework should incorporate gender-disaggregated agroecological indicators as binding monitoring requirements, including traditional variety cultivation rates, seed network participation, intercropping adoption, organic matter management, and women's agricultural governance participation. Finally, WIAD and civil society actors including ActionAid Ghana should be granted formal advisory roles in the FGP's seed system, extension content, and monitoring framework design processes, ensuring that women's ecological knowledge informs program architecture.

The article's central argument; that climate resilience cannot be achieved without ecological intelligence, and ecological intelligence cannot be harnessed without gender equity is both theoretically grounded and practically urgent. The FGP represents a real opportunity to advance Ghana's agricultural transformation in ways that are simultaneously ecologically sustainable, gender-equitable, and climate-resilient. Realizing this opportunity requires moving beyond the false choice between productivity and sustainability, between CSA and agroecology, between gender inclusion and ecological design. These are not competing priorities but mutually reinforcing requirements of genuine agricultural transformation. Addressing gender-agroecology disjuncture is not an optional elaboration of the FGP's gender mainstreaming agenda; it is a prerequisite for the program achieving its own stated transformative objectives. Without ecological intelligence, and without the women who hold most of it, there is no genuine transformation.

Declarations

Competing Interests:

The author has no relevant financial or non-financial interests to disclose.

Ethics Approval:

This study was conducted in accordance with ActionAid International's Feminist Research Guidelines and ActionAid Ghana's institutional research ethics protocols. All procedures comply with ActionAid International's ethical standards for research involving human participants. Informed consent was obtained from all participants prior to data collection.

Informed Consent:

Verbal informed consent was obtained prior to all focus group discussions and key informant interviews. No personally identifying information is included in this manuscript.

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Author Contribution

This article was written entirely by the author (Abazaami Joseph) alone.

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