

From policy proliferation to coherence: Translating agroecological evidence into subnational food-systems governance in Vihiga County, Kenya

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<https://doi.org/10.51867/ajernet.7.4.32>

ABSTRACT

Sustainable agriculture in Kenya is governed by numerous policies addressing crops, soils, livestock, water, agroforestry, climate change, biodiversity, nutrition, marketing and social inclusion. Yet the existence of many broadly supportive instruments has not produced coherent agroecological implementation at the subnational level. This study examined how policy proliferation, fragmented mandates, and weak coordination affect the translation of agroecological evidence into county food-systems governance, using Vihiga County as a case study. More than 50 international, continental, national, sectorial and county instruments were reviewed and interpreted alongside county Agri-food-system data, locally generated biophysical evidence, and a participatory Vihiga County Agroecology Policy (VCAP) development process conducted between October 2022 and April 2025. Evidence integration was guided by Weiss's interactive model of research utilisation. The process included a multidisciplinary Technical Working Group (TWG), stakeholder dialogues, farmer exchange visits, technical validation and public participation involving 4,201 participants across five sub-counties and six venues. The review found substantial normative alignment with agroecology but weak operational complementarity. Recurrent constraints included overlapping mandates, sectorial implementation, inconsistent localization of national strategies, weak links between policy and annual planning, constrained financing and limited feedback between research, extension and decision-making. A food-systems framing helped connect agriculture, environment, nutrition, trade and social inclusion, while interactive evidence use converted research findings and experiential knowledge into five policy themes and nine strategic interventions. The paper concludes that the main policy issue is not a lack of appropriate strategies for sustainable agriculture, but rather an inadequate institutional framework to coordinate them effectively. It proposes a coherence pathway combining a county coordination platform, evidence-to-policy protocols, explicit mandate mapping, producer-inclusive public-private-producer partnerships (4Ps), aligned financing and monitoring, and iterative learning. The Vihiga experience demonstrates how subnational governments can move from policy accumulation to coordinated agroecological action without displacing existing sectorial mandates.

Keywords: Agroecology, Devolution, Evidence-Based Policy, Food Systems, Institutional Coherence, Policy Coordination

I. INTRODUCTION

Agroecology is increasingly recognised as a framework for transforming food systems through ecological production, biodiversity conservation, social inclusion, and knowledge co-creation (High Level Panel of Experts on Food Security and Nutrition [HLPE], 2019; Wezel et al., 2020). Its implementation, however, depends on more than the adoption of individual farm practices. Transformation also requires public institutions capable of coordinating agricultural production, environmental management, nutrition, markets, research, and social policy (Anderson et al., 2019; Hawkes, 2022).

There are at least five international policy foundations or conventions that influence agroecology. The International Covenant on Economic, Social and Cultural Rights (ICESCR) establishes the right-to-food basis (United Nations, 1966); the Convention on Biological Diversity provides the overarching biodiversity framework (United Nations, 1992); the Rome Declaration addresses food security (Food and Agriculture Organization of the United Nations [FAO], 1996); the International Treaty on Plant Genetic Resources for Food and Agriculture covers genetic resources and Farmers' Rights (FAO, 2001); and the Kunming-Montreal Global Biodiversity Framework supports biodiversity conservation, restoration and sustainable land use (Conference of the Parties to the Convention on Biological Diversity, 2022).

In addition, Kenya has a wide range of laws, policies and strategies that support elements of sustainable agriculture and Agri-food systems. Instruments addressing soil and water conservation, agroforestry, climate resilience, food safety, seed systems, biodiversity, extension, animal and public health, and market development collectively contain provisions relevant to agroecology. This apparent abundance creates a paradox: policy coverage is extensive, yet implementation often remains fragmented. Mandates overlap, sectorial agencies may pursue parallel programmes, national strategies are unevenly localised, and county plans do not always translate policy commitments into funded activities. In some cases, development-partner support helps bridge financing and implementation gaps; however, unless it is aligned with county planning and budgeting systems, it may also create parallel delivery arrangements.

1.1 Statement of the Problem

Policy fragmentation is further complicated by conceptual ambiguity surrounding overlapping approaches to sustainable agriculture. Terms such as climate-smart, organic, conservation and regenerative agriculture substantially overlap with agroecological principles, yet their definitions and application vary according to institutional, stakeholder and donor interests (Meridian Institute, 2011; Rhodes, 2017; Giller et al., 2021). Regenerative agriculture, in particular, lacks a consistently accepted definition for policy application (Newton et al., 2020). Competing terminology can therefore encourage differently branded and parallel programmes, despite their pursuit of broadly similar sustainability outcomes, further complicating policy coordination and implementation.

The resulting challenge is better understood as policy incoherence than policy absence. Policy coherence entails aligning objectives, instruments, institutions and implementation processes across sectors and governance levels so that they minimise trade-offs and reinforce shared outcomes (Organisation for Economic Co-operation and Development [OECD], 2021; Browne et al., 2023). It includes vertical coherence across international, national, and county governance; horizontal coherence across sectors; and operational coherence between policy commitments, budgets, work plans, extension services and monitoring. Policy assessment must therefore examine not only the content of individual instruments but also their interaction (Adelle & Weiland, 2012).

Earlier work on Vihiga County modeled the process of developing a subnational agroecology policy (Chumba et al., 2024). The present paper addresses a different question: why do numerous policies supportive of sustainable agriculture still fail to operate as a coherent agroecological system, and what institutional mechanisms can translate diverse evidence into coordinated county action? It therefore shifts the unit of analysis from modeling one policy to examining interactions among the wider policy portfolio, institutional mandates, and evidence-use processes.

1.2 Research Objectives

- i. Map the governance levels and sectorial domains through which existing instruments influence agroecology;
- ii. Identify recurrent forms of fragmentation, overlap and implementation incoherence;
- iii. Examine how locally generated scientific, administrative and experiential evidence was integrated during policy formulation; and
- iv. Derive an institutional pathway for strengthening coherent subnational agroecology governance.

II. LITERATURE REVIEW

2.1 Theoretical Review

The limited and uneven use of evidence in policymaking presents an operational challenge. Research evidence rarely enters policy through a simple linear transfer from scientists to decision-makers. Weiss's interactive model instead portrays policy development as an iterative process in which scientific findings, professional experience, stakeholder interests, political priorities and contextual knowledge converge over time (Weiss, 1980; Nutley et al., 2003; Omari, 2018). This perspective is particularly relevant to agroecology, where farmers' knowledge and place-specific ecological conditions are integral to problem definition, policy formulation and implementation. Building on this theoretical foundation, Weiss's interactive model explain how diverse policy instruments, evidence sources and institutional interests may be translated into coordinated subnational food-systems governance.

2.1.1 Policy Coherence and Food-Systems Governance

Policy coherence provides the analytical bridge between policy abundance and implementation performance. It concerns whether objectives, instruments, institutional mandates and implementation processes reinforce one another rather than generate duplication, gaps or countervailing effects. Coherence is therefore relational: it cannot be established by examining the stated intentions of one policy in isolation. Adelle and Weiland (2012) and Nilsson et al. (2012) show that assessment must consider interactions among policy objectives and instruments, the institutions responsible for them, and the levels at which they are interpreted and implemented. Browne et al. (2023) further demonstrate that coherence has distributive consequences because apparently aligned policies may produce unequal benefits or shift costs among social groups.

For subnational agroecology governance, four dimensions are especially important. Horizontal coherence concerns coordination across agriculture, environment, water, health, nutrition, trade and social-development functions. Vertical coherence concerns the translation of international and continental commitments into national frameworks and, ultimately, county plans and services. Evidence coherence concerns the integration of scientific, administrative, practitioner and community knowledge. Implementation coherence concerns the alignment of policy commitments with mandates, budgets, annual work plans, extension arrangements, monitoring systems and accountability. These dimensions are interdependent: formal agreement among policy objectives has limited practical value when responsibilities remain unclear or when financing and monitoring systems operate separately (OECD, 2021; Hawkes, 2022).

A food-systems perspective broadens this analysis beyond farm production. Food-system outcomes arise from interactions among production, processing, distribution, consumption, nutrition, waste management, ecosystems and livelihoods (Ericksen et al., 2010; Van Berkum et al., 2018). Consequently, an intervention that appears beneficial within one sector may create trade-offs elsewhere—for example, between commercialisation and smallholder inclusion, productivity and biodiversity, or food-safety regulation and informal-market accessibility. Food-systems governance therefore requires mechanisms through which sectors can identify complementarities, negotiate trade-offs and coordinate implementation rather than merely endorse a common policy goal (Hawkes, 2022; OECD, 2021).

2.2 Empirical Review

2.2.1 Agroecological Transitions and Evidence Use

The agroecology literature broadly agrees that transition involves simultaneous ecological, economic, social and institutional change. The 13 consolidated principles described by the High Level Panel of Experts on Food Security and Nutrition and synthesised by Wezel et al. (2020) link recycling, input reduction, soil health, biodiversity and ecological synergies with co-creation of knowledge, fairness, participation and responsible governance (HLPE, 2019; Wezel et al., 2020). Anderson et al. (2019) similarly argue that transformation depends not only on technical practices but also on changes in governance, markets, knowledge relations and power. This scholarship establishes a strong rationale for multisectoral action, but it also implies that programmes branded as agroecological, regenerative, organic or climate-smart may remain partial when institutional arrangements do not connect their overlapping objectives.

Empirical policy reviews show that formal support for sustainable agriculture does not automatically produce coordinated transition. In Zimbabwe, Chiduwa et al. (2023) found opportunities for agroecology across the policy environment but also identified fragmentation and weak integration as barriers to implementation. Kenya presents a comparable coordination challenge: agriculture, soils, agroforestry, climate change, biodiversity, nutrition, extension, food safety, seed systems and enterprise development are governed through multiple sectoral instruments and institutions. The National Agroecology Strategy for Food System Transformation, 2024–2033 provides an integrating national direction, yet implementation still depends on localisation through devolved planning, budgeting, service delivery and interdepartmental coordination (Ministry of Agriculture and Livestock Development, 2024b). Earlier analysis of the Vihiga policy-development process showed the value of stakeholder participation in constructing a county agroecology framework (Chumba et al., 2024), but did not systematically examine how the wider policy portfolio interacts or how dispersed mandates can be organised for implementation.

Research on evidence-informed policymaking likewise challenges the assumption that credible findings move directly into decisions. Evidence is filtered through institutional mandates, professional judgement, political priorities, stakeholder interests and implementation constraints (Nutley et al., 2003; Head, 2016). Oliver and Boaz (2019) therefore call for sustained relationships and spaces for deliberation, while Fedorowicz and Aron (2021) emphasise organisational capacity for acquiring, interpreting and applying evidence. In agroecology, this interactive capability is particularly important because scientific findings must be interpreted alongside farmers' experiential knowledge and locally specific ecological and socioeconomic conditions. Producer-inclusive arrangements such as public–private–producer partnerships can extend participation from consultation into implementation and value-chain governance, although their effectiveness depends on representation, negotiated roles and continuing accountability (Thorpe & Maestre, 2015).

Across these studies, there is broad agreement that coordinated institutions, inclusive participation and iterative learning are necessary for food-system transformation. However, the literature also reveals an unresolved tension between normative alignment and operational coherence. Policies may endorse similar sustainability principles while remaining disconnected in their mandates, financing, delivery systems and monitoring. Existing studies commonly analyse policy content, evidence use or stakeholder participation separately; fewer explain how these elements interact within a devolved government to convert a large, multisectoral policy portfolio into coordinated subnational action.

The principal gap is therefore not whether agroecology is supported in principle, but how supportive yet dispersed policies and evidence sources can be made operationally coherent at county level. Limited empirical attention has been given to the combined relationships among governance levels, sectorial mandates, locally generated evidence, participatory knowledge and the planning–budgeting–implementation cycle in Kenya's devolved context. This study addresses that gap by: mapping the governance levels and sectorial domains relevant to agroecology; identifying

recurring forms of fragmentation, overlap and implementation incoherence; examining how scientific, administrative and experiential evidence interacted during policy formulation; and deriving an institutional pathway for coherent subnational agroecology governance. In doing so, it connects policy-coherence analysis with Weiss's interactive model and tests their practical relevance through the Vihiga County case.

III. METHODOLOGY

3.1 Study Setting and Case-Study Design

Vihiga County is a densely populated agricultural county in western Kenya adjoining the southern section of the Kakamega Forest ecosystem. Small landholdings, acidic soils, food poverty and dependence on smallholder agriculture create strong interactions among production, nutrition, biodiversity and livelihoods. Approximately 73.6% of households participate in farming, while African leafy vegetables, bananas, and poultry are prominent enterprises (Chumba, 2026). These characteristics made Vihiga an appropriate case for examining whether a food-systems approach could connect sectorial policy concerns within a devolved governance setting.

The study used an embedded qualitative case-study design. The principal unit of analysis was the county agroecology governance system; embedded units included policy instruments, institutions, evidence sources, stakeholder processes, and implementation mechanisms. The analytical period covered the evidence and policy-development process from October 2022 to April 2025.

3.2 Evidence Triangulation and Stakeholder Engagement

The policy-document review was triangulated with three complementary evidence streams: scientific evidence generated through shrub characterisation and shrub–cereal–legume intercropping research undertaken as part of the wider doctoral study (Chumba, 2026); knowledge co-created with farmers, technical officers, policymakers, and other stakeholders; and county-level agroecological and agri-food-system data compiled from secondary and primary research sources (Table 1). The secondary data, obtained principally from the Vihiga County Integrated Development Plan 2023–2027 and supplemented by the doctoral study, were reviewed to characterise the agricultural, socioeconomic, and environmental context within which agroecological policy development occurred. They revealed high dependence on smallholder agriculture, substantial rural and food poverty, small landholdings, high population density and environmental constraints. This evidence provided the contextual basis for prioritising land-efficient, biodiversity-sensitive, and livelihood-oriented agroecological interventions.

Table 1

Agroecological and Agri-food System profile of Vihiga County

HOUSEHOLDS AND FARMING	Total households	143,365 (100%)
	Total farmers	105,455 (73.56% of households)
CROP ENTERPRISES	African leafy vegetable farmers	41,250 (39.12% of farmers)
	Banana farmers	38,660 (36.66% of farmers)
	Tea farmers	6,572 (6.23% of farmers)
	Avocado farmers	5,255 (4.98% of farmers)
LIVESTOCK ENTERPRISES	Poultry farmers	34,734 (32.93% of farmers)
	Beekeepers	630 (0.60% of farmers)
	Dairy cattle	45,440
POVERTY INDICATORS	Rural poverty	59,353 households (41.4%)
	Food poverty	43,297 households (30.2%)
LAND RESOURCES	Arable land	404.8 km ²
	Non-arable land	126.2 km ²
	Mean landholding size	0.4 ha
	Population with less than 1 acre	76,983 (73%)
	Farmers with land titles	29%
DEMOGRAPHIC AND ENVIRONMENTAL CHARACTERISTICS	Population density	1,047 persons/km ²
	Approximate tree cover	14%
	Annual rainfall	1,800–2,000 mm
	Relative humidity	41.75%
	Altitude	1,300–1,800 m above sea level
	Main rivers	5
	Protected springs	228
	Soil pH	4.8–5.5

Source: Vihiga County Integrated Development Plan (CIDP), 2023–2027; and Chumba, 2026.

Weiss's interactive model of research utilisation (Weiss, 1980; Omari, 2018) provided the conceptual basis for examining how these different evidence forms accumulated, interacted and informed successive stages of the policy process, including agenda setting, formulation, technical validation, public participation, and approval. The model treated policy development not as a linear transfer of research findings into policy but as an iterative process shaped by interactions among scientific evidence, institutional knowledge, stakeholder experience and administrative and political considerations.

Stakeholder engagement included key-informant dialogues, technical consultations, two farmer exchange visits, validation meetings and public-participation forums. Five sub-county forums were conducted across six venues, involving 4,201 participants. Participants included farmers, traders, women, youth, persons with disabilities, civil-society organisations, researchers, extension personnel, and government departments directly connected to the agri-food system. Feedback from these engagements was documented, consolidated thematically, and incorporated into successive policy drafts.

3.3 Data Sources and Policy-Document Review

The study integrated documentary, empirical and participatory evidence. Documentary sources comprised policy and legal instruments adopted or operational between 1965 and 2026. Instruments were purposively selected for their relevance to sustainable agri-food systems and included legislation, policies, strategies, development plans, implementation frameworks and technical guidelines operating at international, continental, regional, national, sectoral and county levels. Vihiga County agricultural and food-system datasets provided additional production, nutrition, environmental, and livelihood context.

Context-specific scientific evidence included secondary data and locally generated biophysical and agronomic findings on shrub characterisation, shrub–crop intercropping, soil health, crop productivity and ecosystem services. Participatory records were derived from key-informant dialogues, stakeholder consultations, farmer exchange visits, technical-validation meetings and public-participation forums. Together, these sources enabled examination of how scientific evidence, institutional knowledge, policy provisions and stakeholder priorities informed the Vihiga County Agroecology Policy (County Government of Vihiga, 2025).

The instruments were organised by governance level and reviewed according to their objectives, agroecological relevance, institutional responsibilities, implementation mechanisms, relationships, localisation requirements, financing implications and coordination constraints. A coherence matrix informed by Adelle and Weiland (2012) assessed vertical translation across governance levels; horizontal complementarity among relevant sectors; and operational alignment between policy commitments, county plans, budgets, extension arrangements, implementation responsibilities and monitoring systems.

3.4 Data Analysis and Validation

Policy documents and stakeholder evidence were coded deductively using vertical, horizontal and implementation-coherence dimensions adapted from Nilsson et al. (2012). Recurrent institutional constraints were identified inductively through hybrid thematic analysis (Fereday & Muir-Cochrane, 2006), and findings were compared across governance levels and evidence streams. Interpretive validity was strengthened through evidence triangulation, technical-working-group review, public validation and comparison with county administrative data. Public-participation forums were purposively structured to ensure geographical and stakeholder representation, while individual participation was voluntary and conducted in accordance with the Constitution of Kenya (Republic of Kenya, 2010).

IV. FINDINGS & DISCUSSION

4.1 Policy and Legislative Instruments Reviewed

The review identified more than 60 international, continental, regional, national, sectoral and county policy and legislative instruments relevant to agroecological transformation in Kenya (Appendix I). Although these instruments collectively address most dimensions of agroecology—including food security, soil and water management, biodiversity, climate resilience, agroforestry, seed systems, extension, food safety, and market development—their provisions are dispersed across governance levels and institutional mandates. The reviewed instruments in the policy corpus were consolidated into eight policy domains to identify their principal areas of convergence, recurrent coherence constraints, and implications for subnational implementation.

4.1.1 Synthesis of Agroecological Policy Coverage and Coherence Issues

The reviewed instruments were consolidated into eight interrelated policy domains. Together, they demonstrate substantial formal support for agroecology, but also reveal recurring problems of overlapping mandates, fragmented implementation, weak domestication and inadequate coordination. Table 2 summarises the central coherence problem at each governance level, while Appendix I provides the detailed inventory of the instruments reviewed. International

frameworks establish rights to adequate food and sustainable livelihoods while supporting biodiversity conservation, Farmers' Rights, ecosystem restoration and community stewardship. However, these commitments are generally broad and frequently non-binding, with weak translation into financed national and county programmes. Effective domestication requires international principles to be converted into locally defined interventions, budgets, institutional responsibilities and measurable indicators.

Table 2*Cross-level synthesis of policy coherence for agroecology*

International	Rights, food security, biodiversity and sustainable development	Weak localisation and financing	Strong normative foundation but indirect implementation
Continental/regional	Agricultural transformation, resilience and cooperation	Uneven harmonisation with national priorities	Regional commitments require national and county translation
National	Agriculture, climate, biodiversity and natural-resource policy	Fragmented mandates and overlapping implementation	Coordination is more limiting than policy coverage
Sectorial/ministerial	Technical rules for crops, soils, water, seeds, food safety, extension and markets	Siloed programmes and budget constraints	Complementary provisions are not routinely implemented together
County	Local planning, service delivery and stakeholder participation	Variable capacity, alignment and continuity	Counties enable contextualisation but require coordination architecture

The African Union Agenda 2063 and East African Community instruments promote agricultural investment, food security, resilience, women's empowerment and regional cooperation. Yet overlapping commitments and unclear responsibility for domestication weaken implementation. National and county plans should identify the commitments they advance, with assigned responsibilities, budgets and indicators.

National agricultural strategies address productivity, markets, soil management and food-system transformation, but may duplicate activities or create competing priorities. Input subsidies, for example, should be assessed for their effects on soil health, biodiversity, smallholder access and dependence on external inputs. Environmental, forestry and agroforestry instruments likewise support restoration and ecosystem services, but require joint planning across institutions to connect ecological goals with production and livelihoods.

Climate policies encourage adaptation, mitigation and climate finance. Their investments should be assessed against agroecological principles and local priorities, especially where proposed technologies are input intensive or inaccessible to smallholders. Food-security, nutrition, food-safety and postharvest frameworks also require stronger links among agriculture, health, trade and regulatory agencies so that ecological production contributes to healthier diets, safer food, reduced losses and viable markets.

Extension, seed, cooperative and enterprise instruments can support farmer learning, planting material, value addition and market participation. Their implementation should strengthen pluralistic extension, recognise farmer-managed seed systems and include producers in governance and investment decisions.

The Constitution, County Integrated Development Plans and county agroforestry and agroecology policies provide a basis for local action. The remaining task is to connect national commitments with county mandates, annual plans and budgets. Cross-sectoral coordination, costed implementation plans, dedicated financing and shared monitoring indicators would help turn overlapping policy commitments into coherent agroecological practice.

4.1.2 Extensive Policy Coverage but Limited Coherence

The review demonstrated that agroecology in Vihiga County is supported by a broad portfolio of policies and legislation across multiple governance levels. International instruments provide normative commitments on the right to food, biodiversity and sustainable development. Continental and regional frameworks promote agricultural transformation and resilience (New Partnership for Africa's Development [NEPAD], 2003; African Union Commission, 2015; East African Community [EAC], 2011). National and sectoral instruments address crops, soils, water, agroforestry, seed, extension, food safety, climate change, livestock, markets and public health, while newer instruments extend attention to agroecological transformation, postharvest loss reduction and small-enterprise development (Republic of Kenya, 2012a; Ministry of Agriculture and Livestock Development, 2024a, 2024b). County instruments translate these concerns into spatially and socially specific planning.

This breadth creates multiple potential entry points for agroecology, but it also disperses responsibility. No single institution controls all relevant levers, and agriculture sector departments often interpret shared objectives through separate sectoral programmes. Consequently, the presence of supportive provisions does not automatically create complementarity.

4.1.3 Forms of Institutional Incoherence

Four recurrent forms of incoherence emerged. First, mandate fragmentation separated interconnected food-system functions among agriculture, environment, water, health, trade and social departments. The Vihiga County Agroforestry Policy (County Government of Vihiga, 2019) illustrates this challenge: although its placement within the Environment Department is consistent with environmental and forestry mandates, limited formal coordination with the Agriculture Department may fragment implementation and constrain integration with extension, production, value-chain development and markets.

Second, overlapping instruments created uncertainty about operational leadership. Policies addressing climate-smart agriculture, agroforestry, organic agriculture, soil health and agroecology often promoted similar practices but used different concepts, programme structures, and reporting requirements. The issue was not necessarily direct contradiction; it was the absence of mechanisms for identifying complementarities, sequencing actions and assigning joint accountability.

Third, vertical translation was inconsistent. National strategies offered broad direction, but county departments required locally adapted targets, budgets, extension messages and monitoring indicators. County Integrated Development Plans (CIDPs) provided the main planning platform, yet alignment among policy commitments, annual development plans and departmental work plans was uneven and vulnerable to changing political priorities. For example, the Kenya Postharvest Management Strategy for Food Loss and Waste Reduction, 2024–2028 envisages county-level coordination and mainstreaming of postharvest management into county plans, illustrating the additional institutional work required to convert a national strategy into county action (Ministry of Agriculture and Livestock Development, 2024a).

Fourth, financing patterns influenced coherence. Short-term programmes and input subsidies often received greater emphasis than longer-term investments in soil health, biodiversity, farmer learning and institutional coordination. Although the Malabo Declaration called for allocating at least 10% of public expenditure to agriculture, the review showed that policy ambition was not consistently matched by predictable implementation finance (African Union, 2014). Donor-supported projects generated useful innovations but could create parallel delivery arrangements unless integrated into county plans, budgets, and monitoring systems.

4.1.4 Interactive Evidence Use and Coherence Assessment

Consistent with Weiss' interactive model, evidence did not move in a straight line from researchers to policymakers. Scientific findings, county data and experiential knowledge were interpreted through continuing interaction among the Technical Working Group (TWG), farmers, practitioners, technical officers, researchers and political actors. This process helped define the county's agricultural, environmental and socioeconomic challenges and identify opportunities for biodiversity-based production, efficient land use, improved soil health and stronger ecosystem services.

Each group contributed a distinct form of knowledge. Research findings informed the assessment of ecological conditions and potential interventions. County data placed those findings in the context of land pressure, livelihoods and service delivery. Farmers and practitioners tested proposed actions against their experience of planting-material availability, labour demands, cultural acceptability, markets and day-to-day implementation constraints. Technical departments considered institutional responsibilities and the capacity to deliver proposed measures, while the County Assembly examined their fit with statutory mandates, budgets and county development priorities (County Government of Vihiga, 2023).

The value of these exchanges lay partly in the differences they revealed. A measure supported by scientific evidence still needed to be workable for farmers and feasible within county institutions. Successive consultations, technical reviews and revisions brought these considerations together. Areas of agreement became policy priorities; disagreements and resource constraints helped refine the interventions, assign responsibilities and shape implementation arrangements.

Evidence use was therefore an ongoing institutional process rather than a single step preceding a policy decision. Table 3 summarises the evidence streams and the policy functions they served.

Table 3*Evidence Streams and Their Policy Functions*

Scientific evidence	Shrub diversity, intercropping performance, soil health and ecosystem services	Demonstrated locally relevant agroecological options
Administrative data	Farm participation, enterprise profiles, land pressure, poverty and service-delivery information	Defined scale, target groups and planning priorities
Experiential knowledge	Farmer practices, indigenous knowledge, constraints, markets and cultural priorities	Tested feasibility and contextual fit
Policy and legal review	Existing mandates, commitments, gaps, overlaps and implementation mechanisms	Identified entry points and coherence requirements
Deliberative evidence	Technical-working-group dialogue, validation and public participation	Negotiated priorities and strengthened legitimacy

The wider enabling environment was assessed using a coherence matrix informed by systematic policy-assessment principles (Adelle & Weiland, 2012). Each instrument was examined according to its governance level, objectives, agroecological contribution, responsible institutions, implementation mechanisms and implications for subnational action. The matrix identified four forms of policy interaction: complementarity among instruments supporting common objectives; duplication of functions; gaps in responsibilities or implementation mechanisms; and tensions between particular provisions, investments and agroecological objectives. Horizontal coherence extended across agriculture, environment, agroforestry, irrigation, climate, health, nutrition, trade and enterprise, while vertical coherence linked international, continental, regional, national and county frameworks. Irrigation emerged as a critical water-governance dimension, although its alignment with agroecology depends on equitable access, ecological safeguards, the scale and design of irrigation schemes, diversified production and cross-sectoral coordination.

The policy review was complemented by thematic coding and triangulation of locally generated biophysical evidence, stakeholder concerns and proposed interventions. Technical validation assessed the feasibility, institutional location and consistency of proposed actions through a multisectoral process involving government departments (Appendix II), farmers, researchers, civil-society organisations, market actors and community institutions. Public participation across six venues in all five sub-counties (Appendix III) further tested the proposals' legitimacy, accessibility, and responsiveness to locally specific priorities. This interaction generated substantive and procedural outcomes. Evidence was organised into five policy themes: ecological production and soil health; food safety and nutrition security; agroecological enterprises and markets; social and cultural inclusion; and research, knowledge exchange and innovation. Consultation and validation also strengthened institutional ownership and public legitimacy, creating a negotiated evidence base for policy formulation.

4.1.5 From Evidence to an Institutional Coherence Pathway

The synthesis indicated that the Vihiga County Agroecology Policy (County Government of Vihiga, 2025) would add value if it connected existing mandates evidence and programmes within a shared implementation framework. Nine strategic interventions were formulated: an Agricultural Training and Innovation Centre; Public–Private–Producer Partnerships (4Ps); protection of youth and women's rights; community agroecology facilitators; public procurement of sustainably produced foods; Farmers' Rights and biodiversity conservation; harmonisation with sectorial policies; agricultural risk management; and market development for agroecological products.

These interventions address different parts of the county food system, but their implementation depends on common institutional arrangements. For example, the training centre and community facilitators can connect research with farmer learning, while procurement and market development can create demand for sustainably produced foods. Risk management and biodiversity conservation require coordinated decisions about production, natural resources and livelihoods. Treating the interventions as a connected programme can therefore help departments identify shared responsibilities and reduce duplication.

Six mechanisms emerged as necessary across the interventions: an interdepartmental coordination platform; mapping of mandates, gaps and complementarities; a protocol for integrating scientific and experiential evidence; alignment with county plans, budgets and monitoring systems; producer participation in governance and implementation; and continuing learning through research, extension and policy feedback. Together, these mechanisms describe how policy commitments could move into jointly planned and accountable action. The proposed pathway is presented in Table 4.

Table 4*Proposed institutional pathway from policy proliferation to coordinated action*

Coordination platform	Convene agriculture, environment, health, trade, water, social services, research and producer representatives	Creates shared priorities and joint accountability
Mandate and instrument mapping	Identify overlaps, gaps, lead agencies and complementary responsibilities	Reduces duplication and clarifies operational leadership
Evidence-to-policy protocol	Combine research, administrative data, indigenous knowledge and deliberation at defined policy stages	Makes evidence use transparent, iterative and context-sensitive
Planning and financing alignment	Link policy actions to CIDPs, annual plans, budgets and partner investments	Converts commitments into funded implementation
Producer-inclusive governance	Use 4P arrangements and representative farmer participation	Positions producers as co-governors and implementation partners
Learning and accountability	Use shared indicators, extension feedback, periodic review and adaptive revision	Supports institutional learning and continuity

4.1.6 The Policy Challenge is Interaction, not Scarcity

The findings challenge the assumption that sustainable agriculture is constrained mainly by a shortage of policy instruments. Kenya's policy environment already contains substantial agroecological content across agriculture, environment, climate, nutrition and enterprise frameworks. The difficulty is that related commitments are dispersed among institutions with different mandates, planning cycles, budgets and reporting requirements. Introducing another instrument without clarifying these relationships may increase administrative complexity without improving delivery. Policy-review work in Zimbabwe has similarly identified fragmentation and weak integration as constraints on agroecological transition (Chiduwa et al., 2023).

The Vihiga case shows how a county agroecology policy can respond to this challenge by organising existing sectoral mandates around shared food-system outcomes. Such a framework can identify complementary objectives, clarify which institution leads or supports each action, and expose gaps between policy commitments and funded activities. It can also reveal tensions that need deliberate resolution, such as those between short-term production incentives and longer-term soil health or biodiversity goals.

Harmonisation does not require merging policies or removing sectoral expertise. Agriculture, environment, health, trade and social-development institutions retain their specialised responsibilities. Coherence requires them to plan jointly where those responsibilities intersect, agree on implementation roles and monitor results using compatible indicators. In this sense, a county agroecology policy provides a means of connecting production, ecological management, nutrition, markets, cultural knowledge and social inclusion. Its effectiveness depends on whether these connections shape routine decisions about budgets, extension, partnerships and accountability, consistent with the principles of agroecology (FAO, 2018; HLPE, 2019; Wezel et al., 2020).

4.1.7 Agri-Food Systems as an Integrating Model

The agri-food-systems approach provided a practical way to connect sectors whose decisions affect the same producers and consumers. It links production with processing, distribution, consumption, nutrition, waste management, ecological functions and livelihoods (Ericksen et al., 2010; Van Berkum et al., 2018; Hawkes, 2022). In the Vihiga policy process, this wider view helped shift attention from individual farm technologies to the institutions and services needed to make agroecological production viable.

African leafy vegetables illustrate these connections. Expanding their production may require access to suitable seed, farmer training and soil-management support. Sustaining the enterprise also depends on women's participation, safe handling, aggregation, reliable markets and consumer demand. Public procurement could create an additional market while contributing to dietary diversity, provided that smaller producers can meet procurement and food-safety requirements. Agriculture, health, trade and other county functions therefore have roles along the same value chain.

The approach also made potential trade-offs easier to identify. Commercialisation measures may improve market opportunities while introducing compliance costs that exclude smallholders or informal vendors. Climate and productivity programmes may promote technologies that differ in affordability, input requirements and ecological effects. These differences cannot be resolved by assuming that all programmes labeled "sustainable" will produce the same outcomes.

Coherence analysis offers a way to examine such interactions before implementation. By considering who benefits, who bears costs and which institutions control the relevant decisions, county actors can adjust programme design, assign shared responsibilities and monitor food-system outcomes across departmental boundaries.

4.1.8 Evidence-Based Policy as an Interactive Institutional Capability

The Vihiga experience supports an interactive interpretation of evidence use. Scientific results informed policy because they entered a process that also considered county administrative data, farmers' knowledge, institutional mandates and political priorities. Researchers could identify promising agroecological practices and ecological concerns, while farmers and extension officers assessed how proposed interventions might work under local conditions. Technical departments and political actors then considered responsibilities, resources and public priorities. Evidence gained policy relevance through these exchanges and the revisions that followed.

This interpretation accords with scholarship showing that evidence-informed policymaking depends on relationships, interpretation and institutional context as well as the availability of research (Head, 2016; Oliver & Boaz, 2019; Fedorowicz & Aron, 2021). It also points to a practical requirement: county governments need recurring arrangements for bringing different forms of knowledge into planning and implementation. Periodic meetings alone are insufficient unless participants can record the evidence considered, explain why particular options were selected and review whether those choices produce the intended results.

An institutional evidence-to-policy process could link researchers, extension services, producers and policymakers at defined stages of the county planning cycle. It would allow proposed interventions to be tested, monitored and revised as new findings and implementation experience emerge. This matters in agroecology because the suitability of practices varies with soils, rainfall, farm resources, labour, markets and local knowledge. Maintaining these feedback channels would help the county adapt its policy in response to observed outcomes while making decisions more transparent and accountable.

4.1.9 Producer-Inclusive Governance and Implementation

Public participation strengthened the legitimacy of the Vihiga policy process, but consultation alone cannot ensure that producers influence implementation. Among the nine strategic interventions identified in Section 4.1.5, the public-private-producer partnership (4P) model warrants particular attention. It positions smallholder farmers as partners in governance, value-chain investment and delivery, rather than limiting their role to receiving extension advice or supplying produce (Thorpe & Maestre, 2015; Maru et al., 2026). This approach reflects agroecology's emphasis on co-creation, participation and locally grounded decision-making.

Giving producers a formal role could improve decisions about planting materials, training priorities, aggregation, quality requirements and access to markets. It could also help public and private actors understand the costs and risks farmers face before committing resources to an intervention. These benefits depend, however, on how representatives are selected and whose interests they can advance. Farmer organisations and partnership forums may reproduce existing inequalities if better-resourced producers dominate meetings, contracts or market opportunities. Women, youth, persons with disabilities, indigenous-knowledge holders and resource-poor farmers therefore need deliberate representation and practical means of participating. Their roles should extend beyond attendance to decisions about priorities, resource allocation and assessment of results. Clear responsibilities, accessible information and regular reporting would help representatives remain accountable to the producers they serve. Producer participation should also continue after policy approval. Linking representative structures to implementation monitoring, evaluation and learning (MEL) would allow farmers to report emerging barriers, assess whether promised benefits reach different groups and contribute to adjustments over successive planning cycles.

4.1.10 Implications for Other Counties in Kenya

The proposed pathway may be useful to other counties as a governance process, but its interventions should be adapted to local circumstances. Counties differ in agroecological conditions, land use, commodity value chains, institutional mandates, budgets and political priorities. These differences affect which problems require joint action and which institutions can lead it.

Adaptation should begin by mapping relevant policies and institutional responsibilities, appraising local scientific and administrative evidence, and engaging producers and other stakeholders in identifying priorities. Counties can then assess where existing programmes complement one another, where responsibilities overlap and where implementation lacks funding or coordination. The Vihiga policy themes and interventions offer examples for this exercise, but their relevance and sequence should be tested locally.

Evaluation should focus on whether the resulting arrangements improve joint planning, budget alignment, service delivery, and producer participation. Comparing these implementation experiences across counties could help refine the pathway while preserving the flexibility needed for different ecological and institutional settings.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The central constraint to agroecological transition in Vihiga County was not the absence of policies relevant to sustainable agriculture. It was the limited capacity of numerous instruments and institutions to operate coherently. Fragmented mandates, sectoral implementation, inconsistent localisation, weak planning and financing links, and limited research-extension-policy feedback reduced the cumulative value of otherwise supportive frameworks. By combining a multi-level policy review with administrative data, locally generated scientific evidence and broad stakeholder participation, the VCAP process converted dispersed knowledge into an integrating framework. Weiss's interactive model explains this achievement more adequately than a linear research-transfer model because evidence was interpreted, negotiated and refined throughout the policy cycle.

5.2 Recommendations

The findings support six linked recommendations for converting policy coverage into coordinated implementation: **Establish a county agroecology coordination platform.** Because relevant mandates were dispersed across agriculture, environment, water, health, nutrition, trade and social services, the County Government should constitute a formally mandated interdepartmental platform with producer, research, civil-society and private-sector representation. **Maintain a mandate-and-instrument matrix.** The platform should identify lead and supporting institutions, areas of overlap, implementation gaps and shared indicators for each strategic intervention, and review the matrix during annual planning to reduce duplication and clarify accountability.

Link policy commitments to plans and finance. Agroecology priorities should be incorporated into the CIDP, annual development plans, departmental work plans, budgets and partner agreements through costed actions, dedicated budget lines and jointly reported outputs. **Institutionalise an evidence-to-policy and learning protocol.** Scientific findings, county administrative data, extension feedback and farmer knowledge should be appraised at defined stages of planning, implementation and review, using shared monitoring, evaluation and learning (MEL) indicators and documented reasons for policy decisions.

Operationalise producer-inclusive 4P arrangements. Farmers should participate as co-governors and implementation partners—with deliberate representation of women, youth, persons with disabilities, indigenous-knowledge holders and resource-constrained producers. **Localise and evaluate implementation over multiple planning cycles.** National and county institutions should align targets and reporting requirements, while comparable counties adapt the Vihiga pathway through their own mandate mapping and stakeholder analysis. Evaluation should test whether coordination changes financing, service delivery and producer-level outcomes before wider scaling. Future research could develop and validate a Practice–Priority–Coherence (PPC) framework to systematically align agricultural practices, stakeholder priorities, and policy commitments in subnational food-systems governance.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding Declaration

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Appendix I

Inventory of Policy and Legislative Instruments Reviewed

Governance level / domain	Instruments reviewed (year/period)	Agroecological relevance and principal coherence issue
International conventions, treaties, rights, food systems and biodiversity	ICESCR (1966); Convention on Biological Diversity (CBD) (1992); Rome Declaration on World Food Security (1996); International Treaty on Plant Genetic Resources for Food and Agriculture (2001); HLPE agroecology recommendations (2019); UN Food Systems Summit outcome and CFS Voluntary Guidelines on Food Systems and Nutrition (2021); Kunming–Montreal Global Biodiversity Framework (2022)	Rights, food security, sovereignty, Farmers' Rights, participation and biodiversity commitments support agroecology, but remain weakly translated into funded and accountable county action.

African Union development and investment	CAADP (2003); Malabo Declaration (2014); Agenda 2063 (2015); Kampala Declaration and CAADP Strategy and Action Plan (2026–2035)	Promote investment, resilience and food-system transformation; domestication, financing and responsibility for implementation remain inconsistent.
East African regional cooperation	Treaty for the Establishment of the EAC (1999); EAC Food Security Action Plan (2011–2015); EAC Food and Nutrition Security Action Plan (2019–2023)	Provide a regional basis for agricultural cooperation, but links to national and county frameworks are weak.
Constitution and planning	Constitution of Kenya (2010); Kenya Vision 2030 (2008–2030)	Establish rights, devolution and sustainable-development duties; intergovernmental coordination and balance between growth, equity and ecology remain uneven.
Agriculture strategies	Strategy for Revitalizing Agriculture (2004–2014); Agricultural Sector Development Strategy (2010–2020); Kenya Climate-Smart Agriculture Strategy (2017–2026); Agriculture Sector Transformation and Growth Strategy (2019–2029); National Agriculture Policy (2021)	Address productivity, markets, resilience and resources, but overlapping strategies, input-intensive approaches and unclear accountability weaken coherence.
Extension and organic agriculture	National Agricultural Sector Extension Policy, Sessional Paper No. 4 of 2011 (operationalized 2012); Kenya Agricultural Sector Extension Policy (2023); Draft National Organic Agriculture Policy (2016 draft)	Support pluralistic extension and ecological production; pre-devolution design and prolonged draft status constrain county implementation.
Soils, environment, biodiversity and agroforestry	National Environment Policy (2013); National Biodiversity Strategy and Action Plan (2019–2030); Agricultural Soil Management Policy (2023); Kenya National Agroforestry Strategy (2025–2035)	Support soil health, ecological restoration and biodiversity, but implementation is constrained by limited operational guidance, donor dependence and weak coordination across agriculture, environment, forestry and climate institutions. Alignment with the national agroforestry and agroecology strategies remains unclear and may restrict integration with extension, production and markets.
Agroecology and food-system investment	National Agroecology Strategy for Food System Transformation (2024–2033); Draft National Agri-Food Systems Investment Plan (version reviewed in 2025)	Provide the clearest transition and investment frameworks; delivery depends on county domestication, budgets and alignment with existing strategies.
Climate governance and finance	Climate Change Act (2016); National Climate Change Framework Policy (2016); National Climate Finance Policy (2018); National Climate Change Action Plans (2018–2022; 2023–2027)	Enable mainstreaming, nature-based solutions and finance, but responsibilities and funding remain dispersed and weakly integrated with agroecology.
Water resources, irrigation and drainage	National Irrigation Policy (2017); Irrigation Act (2019); National Irrigation Sector Investment Plan (NISIP)	Support water security, efficient irrigation, drainage, farmer participation and climate resilience; coherence requires catchment-based allocation, environmental safeguards, equitable access, integration with soil health and diversified production, and coordination across irrigation, agriculture, water, environment and county institutions.
Food, nutrition and postharvest systems	National Food and Nutrition Security Policy (2011); National Nutrition Action Plan (2012–2017); Kenya Postharvest Management Strategy for Food Loss and Waste Reduction (2024–2028)	Connect production, nutrition, circularity and food loss, but agricultural, health and county delivery systems remain fragmented.
Food and feed safety	Draft National Food Safety Policy (2021); Public Health Act, Cap. 242; Food, Drugs and Chemical Substances Act, Cap. 254; Food and Feed Safety Control Co-ordination Bill (2023)	Protect public health and consumers; multiple agencies and statutes create duplication, enforcement gaps and weak value-chain coordination.
Seed systems and biosafety	Seeds and Plant Varieties Act, Cap. 326 (amended 2012); Biosafety Act (2009)	Regulate seed and biotechnology risks, but formal certification and breeders' rights are poorly aligned with farmer-managed seed systems and biodiversity.
Crop-sector regulation	Crops Act (2013; revised 2022); Crops (Food Crops) Regulations (2016)	Support standards, markets and farmer incomes; inspection powers, taxation and national–county mandates may conflict.

Livestock and One Health	Animal Diseases Act, Cap. 364 (Act No. 4 of 1965, revised to 31 December 2022); Veterinary Surgeons and Veterinary Para-Professionals Act, No. 29 of 2011	Support animal health, food safety, veterinary-practitioner regulation and paraprofessional training, but remain weakly integrated with agri-food systems, biodiversity and One Health governance, with limited recognition and responsible incorporation of validated Indigenous veterinary knowledge and ethnoveterinary practices.
Cooperatives and enterprises	Co-operative Societies Act, Cap. 490; Crops (Coffee) (General) Regulations (2019); Micro and Small Enterprises Act (2012); Kenya Micro and Small Enterprises Policy (2020)	Enable organization, finance, value addition and markets; overlapping institutions and weak governance constrain agroecological enterprises.
Gender and inclusion	National Policy on Gender and Development (2019)	Promotes equality and participation, but is inconsistently mainstreamed into land, finance, extension and value chains.
Fiscal policy	Medium-Term Revenue Strategy, FY 2024/25–2026/27	Revenue measures influence value chains; agricultural taxation may conflict with smallholder-income and market-participation objectives.
County planning and agroecology	County Integrated Development Plans, including Vihiga CIDP 2023–2027; Vihiga County Agroforestry Policy (2019); Vihiga County Agroecology Policy (2025)	Provide the local implementation platform; coherence requires cross-departmental ownership, legislation, costed plans, budgets and monitoring.

Note. CAADP = Comprehensive Africa Agriculture Development Programme; CBD = Convention on Biological Diversity; CFS = Committee on World Food Security; CIDP = County Integrated Development Plan; EAC = East African Community; HLPE = High Level Panel of Experts on Food Security and Nutrition; ICESCR = International Covenant on Economic, Social and Cultural Rights; UN = United Nations.

Appendix II

Stakeholder Analysis¹

Agriculture and food systems	50
Environment (forestry, water, climate change and energy)	20
Social services (education, public health, gender and culture)	10
Trade and markets (marketing and cooperatives)	8
Infrastructure (roads, irrigation, and information and communication technology)	5
Academia, research and innovation	4
Governance, civil society, and policy	3
TOTAL	100

Note¹. The percentages are indicative sectoral weights derived from the stakeholder-analysis exercise and represent estimated relative contributions to policy formulation; they do not represent the numerical composition of public-participation attendees.

Appendix III

Public Participation Venues and Attendance²

Sabatia	North Maragoli	Kigama Friends Church	791
Vihiga	South Maragoli	Gavalagi Friends Church	750
Hamisi	Tambua	Ivola Pentecostal Assemblies of God (PAG) Church	540
Hamisi	Shamakhokho	Salvation Army Lusalaga	640
Emuhaya	Central Bunyore	Mulwanda Church of God	745
Luanda	Luanda South	Ekwanda Revival Church	735
TOTAL	Five sub-counties	Six venues	4,201

Note². The process combined institutional representation from seven stakeholder sectors with broad-based participation by 4,201 participants across all five sub-counties. Together, these inputs linked scientific and institutional evidence with community priorities and lived experiences.