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# From Policy Ambition to Scaled Impact: Assessing Kenya's Climate Adaptation and Mitigation Frameworks for Innovation Uptake

Idil Ires

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## Author

**Idil Ires**, Researcher – Enabling Environment, International Water Management Institute (IWMI)

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**Front cover photo:** Solar pumps empower female farmers in India (photo credit: Tanmoy Bhaduri/IWMI)

**Back cover photo:** Solar pumps are empowering female farmers in India (photo credit: Tanmoy Bhaduri/IWMI)

## Summary

Kenya has developed one of the most comprehensive climate and agricultural policy landscapes in Africa, with strong commitments to climate adaptation, sustainable food systems, and resilient livelihoods. Yet despite this extensive landscape, the translation of innovation into large-scale impact remains uneven. Climate variability continues to undermine agricultural productivity and deepen rural vulnerability, with an estimated 1.9 million people in IPC (Integrated Food Security Phase Classification) Phase 3 or worse in 2024 and projections rising to 2.1 million by 2026. Structural constraints, including reliance on rainfed agriculture, limited irrigation coverage, fragmented institutional mandates, inconsistent financing, and weak coordination, continue to inhibit the scaling of proven technologies and institutional models. This report seeks to address this gap between Kenya's strong policy ambition and the practical realities of implementation by examining how well current national and county-level frameworks enable or constrain innovation scaling across food, land, and water systems.

The analysis was conducted under Area of Work 1 (AoW1): Engaging and Empowering Stakeholders of CGIAR's Scaling for Impact (S4I) initiative, which emphasizes demand-driven, user-centered approaches to innovation scaling. Two primary inputs informed the assessment: (1) a comprehensive policy and program inventory capturing over 100 national frameworks and more than 40 initiatives across six thematic areas, and (2) a multi-stakeholder validation workshop with researchers, government officials, and civil society representatives. This report focuses on the Climate Adaptation and Mitigation cluster, which comprises 57 national and county-level policy instruments spanning climate governance, agriculture, energy, water, forestry, disaster risk management, climate finance, and devolved governance.

The inventory review shows that Kenya's climate governance architecture is extensive, diverse, and generally well-aligned with national development goals. Foundational frameworks such as the Climate Change Act (2016), National Adaptation Plan (2015–2030), and successive National Climate Change Action Plans (NCCAPs) provide a strong regulatory backbone and define adaptation priorities across sectors. Sector-specific instruments, including the Climate-Smart Agriculture Strategy (2017–2026), Water Act (2016), and Energy Act (2019), embed climate considerations into agricultural transformation, water management, and energy access. County-level instruments—most notably the County Climate Change Funds (CCCFs) and County Climate Change Acts—have made Kenya a continental leader in devolved climate finance and locally led adaptation. Emerging frameworks, including the Climate Change (Amendment) Bill (2023) and Carbon Markets Regulations (2024), signal a shift toward climate-informed industrial planning that aligns mitigation, finance, and investment incentives.

However, the validation workshop revealed that the key challenge lies not in the lack of policies but in coherence, coordination, financing, and capacity. Participants emphasized that while frameworks are generally aligned with innovation scaling objectives, implementation is constrained by overlapping mandates among ministries, unpredictable funding flows, particularly to counties, limited data systems, and inadequate institutional capacity. The need for stronger integration of research evidence, climate information services, and private-sector engagement emerged as a recurring theme. Policies such as the NCCAP (2023–2027), NDC (2020), Climate-Smart Agriculture Strategy, and Water Act (2016) were identified as having the most significant momentum, but their effectiveness depends on improved coordination and sustained investment. County-level mechanisms, especially the Financing Locally Led Climate Action Program and CCCFs, were highlighted as transformative but financially fragile.

Overall, the report finds that Kenya possesses a robust climate policy foundation that is partially enabling but not yet delivering the systemic scaling required to meet national resilience and development goals. To strengthen the enabling environment, the report recommends enhancing cross-ministerial coordination; securing predictable and adequate climate financing; investing in county-level technical and fiduciary capacity; harmonizing monitoring, reporting, and climate information systems; and building structured public-private partnerships to accelerate innovation uptake in areas such as irrigation, clean energy, climate information services, and carbon markets. By synthesizing evidence from policy analysis, literature, and stakeholder insights, this report provides actionable guidance for aligning innovations, institutions, and investments. Strengthening these linkages will be essential for enabling Kenya to scale climate-smart, nutrition-sensitive, and livelihood-enhancing innovations that can deliver sustainable and inclusive growth in the face of growing climate risks.

## Abbreviations

AFR100 – African Forest Landscape Restoration Initiative

AoW1 – Area of Work 1 (Engaging and Empowering Stakeholders)

ASTGS – Agricultural Sector Transformation and Growth Strategy

BETA – Bottom-Up Economic Transformation Agenda

CBD – Convention on Biological Diversity

CCCF – County Climate Change Fund

CCD – Climate Change Directorate

CIDP – County Integrated Development Plan

CSA – Climate-Smart Agriculture

DRM – Disaster Risk Management

EDE – Ending Drought Emergencies framework

EPRA – Energy and Petroleum Regulatory Authority

FAO – Food and Agriculture Organization of the United Nations

FLLoCA – Financing Locally Led Climate Action Program

GCF – Green Climate Fund

GDP – Gross Domestic Product

GDC – Geothermal Development Company

GESIP – Green Economy Strategy and Implementation Plan

IGAD – Intergovernmental Authority on Development

IIED – International Institute for Environment and Development

IPC – Integrated Food Security Phase Classification

IWMI – International Water Management Institute

KCSAP – Kenya Climate-Smart Agriculture Project

KNBS – Kenya National Bureau of Statistics

LLA – Locally Led Adaptation

LT-LEDS – Long-Term Low-Emission Development Strategy

MoALFC – Ministry of Agriculture, Livestock, Fisheries and Cooperatives

NAP – National Adaptation Plan

NAMA – Nationally Appropriate Mitigation Actions

NCCAP – National Climate Change Action Plan

NDC – Nationally Determined Contribution

NDMA – National Drought Management Authority

NDMP – National Disaster Management Policy

PIM – Public Investment Management

PPP – Public–Private Partnership

REDD+ – Reducing Emissions from Deforestation and Forest Degradation

REREC – Rural Electrification and Renewable Energy Corporation

SDG – Sustainable Development Goal

S4I – Scaling for Impact (CGIAR Initiative)

UNFCCC – United Nations Framework Convention on Climate Change

WRA – Water Resources Authority

WSP – Water Sector Program

# 1. Introduction

Kenya stands at the forefront of agricultural transformation in Africa, with the sector contributing approximately 21.8 percent of Gross Domestic Product (GDP) and employing nearly one-third of the national workforce (Kenya National Bureau of Statistics [KNBS] 2023). Yet progress toward resilience and inclusive growth remains constrained by intensifying climate variability and the limited translation of innovation into impact at scale. Despite a wide range of national and county-level policies designed to foster innovation in food, land, and water systems, agricultural performance continues to be undermined by recurrent droughts and floods that threaten productivity and livelihoods. In 2024, an estimated 1.9 million Kenyans were classified in Integrated Food Security Phase Classification (IPC) Phase 3 (crisis) or worse, with projections suggesting this could rise to 2.1 million by 2026 (IPC Kenya 2024). These vulnerabilities stem from persistent structural constraints: a heavy reliance on rainfed agriculture, underinvestment in irrigation—only 2.4 percent of cultivated land is irrigated—and weak integration between climate adaptation, food systems, and employment strategies.

Beneath these sectoral challenges lie deeper systemic barriers, such as fragmented institutional mandates, weak coordination, inadequate financing, and limited accountability, that continue to impede the scaling of proven innovations and institutional models (World Bank 2023; CGIAR 2024). Kenya's progress in developing a comprehensive policy framework has been significant, but policy proliferation has also produced overlap, inconsistencies, and what many stakeholders refer to as coordination fatigue. While numerous frameworks articulate progressive goals such as climate-smart agriculture, renewable energy integration, and inclusive value-chain development, few translate these ambitions into actionable mechanisms for financing, implementation, and performance monitoring (Food and Agriculture Organization of the United Nations [FAO] 2022). This gap between policy intent and execution leaves innovation scaling largely rhetorical, with limited institutional incentives, weak private-sector participation, and insufficient inter-ministerial collaboration. Under Kenya's devolved governance system, county governments are expected to operationalize national frameworks, yet they often face limited fiscal space, technical capacity, and policy coherence (Government of Kenya 2022). Thus, the challenge is not a lack of policies, but uneven coherence, integration, and responsiveness to user demand. Identifying which policies are most enabling, which remain underfunded or under-implemented, and where institutional bottlenecks persist is critical to guiding targeted reform and investment.

This policy validation exercise, conducted under Area of Work 1 (AoW1) of CGIAR's Scaling for Impact (S4I) program, aims to bridge the gap between Kenya's strong policy ambition and the realities of implementation. It assesses whether existing policies and programs are effectively aligned with national development priorities and responsive to the practical needs of system actors, including farmers, agribusinesses, and local governments. The analysis also examines the degree of political and financial commitment underpinning these frameworks and the governance and coordination arrangements shaping implementation. By systematically evaluating this landscape, the exercise identifies where scaling opportunities exist and where greater policy coherence, investment alignment, or institutional strengthening are required.

The S4I Program was established to bridge the divide between research innovations and real-world application by strengthening the enabling environments that allow proven solutions to be adopted, adapted, and scaled sustainably. Within this framework, AoW1—Engaging and Empowering Stakeholders emphasizes a demand-driven approach to scaling. Rather than pushing research outputs into policy, it starts from user priorities and “demand signals,” namely, evidence of farmer needs, market behavior, and institutional capacity, to guide adaptive solutions, strengthen ownership, and ensure that scaling strategies are contextually relevant and inclusive.

In Kenya, this approach was operationalized through the development of a comprehensive policy and program inventory, capturing over 100 policies, strategies, and legislative instruments, along with more than 40 national and donor-supported programs. These were organized under six CGIAR impact areas: (1) climate adaptation and mitigation; (2) environmental health and biodiversity; (3) gender equality, youth, and social inclusion; (4) nutrition, health, and food security; (5) poverty reduction, livelihoods, and jobs; and (6) cross-cutting enabling environment. Together, they reflect Kenya's broad policy commitment to sustainable agricultural transformation, climate resilience, and inclusive growth. Flagship frameworks include the Agriculture Sector Transformation and Growth Strategy (ASTGS 2019–2029), Climate Change Act (2016), National Food and Nutrition Security Policy, and the Bottom-Up Economic Transformation Agenda (BETA).

A validation workshop formed a central component of this assessment, complementing the policy inventory and literature review through participatory engagement with key stakeholders in Kenya's climate policy landscape. Designed in alignment with S4I's goal of fostering stakeholder-driven, adaptive solutions, the workshop convened representatives from the Ministry of Agriculture and Livestock Development, the Kenya Meteorological Department, the Eastern Africa Grain Council, Participatory Ecological Land Use Management Kenya, and researchers from the International Water Management Institute (IWMI) and CGIAR. This composition ensured representation across public, research, and civil society actors directly engaged in climate resilience, innovation, and policy implementation.

The workshop focused on validating policies and programs within the Climate Adaptation and Mitigation cluster, comprising 57 national and county-level frameworks identified in the inventory. Using S4I's validation template,

participants analyzed five key dimensions: (1) relevance of policies to innovation scaling; (2) degree of alignment with national and sectoral goals; (3) level of political, financial, and institutional commitment; (4) key governance and capacity gaps; and (5) recommended reforms or coordination mechanisms. Rather than reviewing each policy line by line, the exercise emphasized strategic sense-making, identifying high-impact frameworks, assessing their real-world momentum, and pinpointing cross-cutting opportunities or constraints.

The workshop discussions were guided by four research questions:

- How well do Kenya’s national and county-level policies facilitate the scaling of innovations that advance climate adaptation and mitigation goals?
- What levels of political, financial, and institutional commitment support the implementation of these policies?
- What governance, coordination, or financing barriers constrain scaling in practice?
- How can the coherence and responsiveness of the climate policy ecosystem be strengthened to accelerate innovation uptake?

The findings from this participatory process form the empirical foundation for this report. They complement the document analysis by grounding it in institutional realities and stakeholder experience, providing insight into the functionality, credibility, and coherence of Kenya’s climate policy ecosystem. Against this backdrop, the objectives of this report are fivefold: (1) to validate the comprehensiveness and relevance of Kenya’s policies and programs that support innovation scaling in food, land, and water systems; (2) to assess alignment—how well these frameworks facilitate scaling within the three priority impact areas of climate adaptation and mitigation, nutrition and food security, and livelihoods and jobs; (3) to evaluate the level of political and financial commitment supporting implementation; (4) to identify enabling factors and systemic gaps across governance, capacity, and financing dimensions; and (5) to recommend strategic actions for strengthening Kenya’s enabling environment for scaling, including reforms, coordination mechanisms, and financing strategies.

This report offers value by translating policy analysis into actionable insight. It contributes to S4I’s broader mission of linking research innovations with the systems that sustain them, providing evidence on how Kenya’s policy ecosystem can become more demand-responsive, coherent, and adaptive. By identifying where enabling conditions are strong and where they require reinforcement, the report offers a pathway for aligning innovation, investment, and institutional support to accelerate inclusive and climate-resilient scaling across the country.

## 2. A Review of the Inventory on Kenya’s Climate Policies

Among the six priority impact areas identified in the policy inventory, this review focuses on climate adaptation and mitigation, the area where Kenya has built one of the most advanced and extensive policy architectures in Africa. The climate-related policies captured in this inventory constitute the core of Kenya’s climate governance system, spanning national frameworks, sector-specific strategies, and devolved county instruments. Together, they illustrate the extent to which climate action has become embedded within the country’s broader development planning and governance arrangements. This depth of policy activity reflects Kenya’s recognition that climate change is not merely an environmental concern but a fundamental economic and social challenge that shapes agricultural productivity, water availability, public health outcomes, and rural and urban livelihoods.

### 2.1. Introduction

The inventory conducted under this assessment captured 57 climate-related policy instruments across seven main categories, as shown in Table 1. At the national level, ten foundational frameworks define Kenya’s overarching approach to climate governance, translating global commitments into domestic law, strategy, and coordinated action. Together, these frameworks provide the legal, strategic, and financial backbone for integrating climate change into national and county planning while aligning Kenya’s development priorities with international obligations under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.

Complementing these are 21 sector-specific policies that embed climate resilience and low-emission development across five key sectors: agriculture, forestry and land use, water, energy, and transport. In agriculture, frameworks such as the Climate-Smart Agriculture Strategy (CSA Strategy, 2017–2026) and the Agricultural Sector Transformation and Growth Strategy (ASTGS, 2019–2029) promote sustainable production, irrigation efficiency, and agribusiness development. Forestry and land use policies, including the Forest Policy (2014) and the Forest Conservation and Management Act (2016), focus on forest restoration, biodiversity conservation, and community participation in landscape management. The Water Act (2016) and National Water Policy (2012) provide the foundation for integrated water resource management and climate-resilient irrigation systems, while energy sector instruments such as the Energy Act (2019) and Energy Efficiency and Conservation Strategy (2020) advance renewable energy, mini-grids, and bioenergy. Finally, the Transport Policy (2009) and E-Mobility Strategy (2023) guide the transition to low-carbon logistics and sustainable mobility. Together, these frameworks reinforce Kenya’s

pursuit of sustainable, inclusive, and market-oriented growth in line with Vision 2030 and the Sustainable Development Goals (SDGs).

Table 1. Summary of Climate-Related Policies in Kenya

Category	Number in Inventory	Representative Instruments	Policy Focus	Lead Authority
<b>Subheading</b>				
Climate Policies, Strategies & Frameworks	10	NCCRS (2010); Climate Change Act (2016); NDCs (2015, 2020); NCCAPs (2013–17, 2018–22, 2023–27); National Adaptation Plan (2015–2030)	Provide legal and strategic frameworks for coordinated climate action and alignment with UNFCCC and Paris Agreement commitments.	Ministry of Environment, Climate Change & Forestry; Climate Change Directorate
Sector-Specific Climate Policies	21	ASTGS (2019–29); CSA Strategy (2017–26); Livestock Policy (2013); Forest Policy (2014); Water Act (2016); Energy Act (2019); Waste Management Policy (2021)	Mainstream climate resilience, low-carbon growth, and sustainable resource use across agriculture, water, energy, and forestry sectors.	Ministries of Agriculture, Water, Energy, and Transport; NEMA; Kenya Forest Service
Disaster Risk Reduction & Resilience	4	Drought Risk Management and EDE Framework (2013); Disaster Risk Financing Strategy (2021); Draft National Disaster Management Policy (2023); Contingency Plans (El Niño, Drought)	Enhance national and county preparedness, risk reduction, and adaptive safety nets for climate shocks.	NDMA; National Treasury; Ministry of Interior
Climate Finance & Investment Instruments	4	Climate Change Fund (2016); Green Economy Strategy (2016–30); Public Investment Management Guidelines (2019); County Climate Funds	Mobilize and govern financial mechanisms for adaptation, mitigation, and green growth investment.	National Treasury; Climate Change Directorate
Devolved Governance & County Instruments	4	County Climate Acts; County Climate Action Plans; County Fund Regulations; Climate Integration in CIDPs	Operationalize locally led climate actions through devolved planning, budgeting, and implementation mechanisms.	County Governments; Council of Governors; Ministry of Devolution
Emerging Frameworks	6	Climate Change Bill (Draft, 2023); Updated National Adaptation Plan (2023–27); LT-LEDS (2022); Cooling Action Plan (2022); E-Mobility Strategy (2023); CSA Strategy Revision (ongoing)	Reflect Kenya’s evolving priorities in green transition, innovation scaling, and private-sector engagement.	Parliament; Ministries of Environment, Agriculture, and Energy
Cross-Cutting Frameworks	8	Vision 2030; Medium-Term Plans (I–IV); Environment Policy (2013); Biodiversity Strategy (2010); Green Economy Strategy (2016); Urban Development Policy (2016); Fisheries Policy (2008); Health Policy (2014)	Set overarching development, environmental, and governance direction for integration of climate and sustainability objectives.	Presidency; Ministries of Planning, Environment, Lands, Health, and Fisheries

Four additional interlinked categories on disaster risk reduction and resilience frameworks, county-level climate instruments, emerging frameworks, and cross-cutting frameworks. Disaster risk reduction and resilience frameworks include the *Drought Risk Management and Ending Drought Emergencies Framework (2013)* and the *Disaster Risk Financing Strategy (2021)*, which strengthen Kenya's ability to anticipate, absorb, and adapt to climate shocks. These are supported by climate finance and investment instruments, such as the *Climate Change Fund (2016)* and *Green Economy Strategy and Implementation Plan (2016–2030)*, which establish the financial architecture necessary for sustained implementation of adaptation and mitigation measures. Kenya's devolved system of governance has also led to the emergence of county-level climate instruments, including *County Climate Change Acts*, *County Climate Action Plans (CCCAPs)*, and *County Climate Funds (CCCFs)*. These localized mechanisms enable counties to plan, budget, and implement climate actions in alignment with local needs, ensuring a bottom-up approach to resilience building. The inventory further highlights emerging frameworks that reflect evolving global and domestic priorities, such as the *Long-Term Low Emission Development Strategy (2022)*, *National Cooling Action Plan (2022)*, and *E-Mobility Strategy (2023)*. These innovations signal Kenya's growing focus on energy transition, urban sustainability, and private-sector engagement in the green economy. Finally, a set of cross-cutting frameworks, including *Kenya Vision 2030*, the *National Environment Policy (2013)*, and the *National Biodiversity Strategy (2010)*, provides the broader development and environmental governance context for climate action. Collectively, the policies captured in this inventory illustrate Kenya's strong institutional and political commitment to climate resilience, even as challenges of coherence, financing, and local implementation remain key areas for reform.

Together, these categories reflect a multi-level governance approach in Kenya's climate policy ecosystem. The following section unpacks the content of these frameworks and provides an analytical review of their design, focus, and implementation through the lens of existing academic and policy literature. The analysis examines how these instruments collectively shape the enabling environment for innovation scaling, highlighting coherence, financing, and institutional coordination as central determinants of their effectiveness.

## 2.2. Climate Policies, Strategies, and Frameworks

Kenya's policy architecture for climate adaptation and mitigation represents one of the most advanced and institutionalized frameworks in Africa, encompassing legal, strategic, and financial instruments designed to integrate climate considerations into all levels of national and county planning. The policy inventory compiled under this assessment identified ten foundational frameworks that provide the structural basis for the country's climate governance system. These include the *Climate Change Act (2016)*, three successive *National Climate Change Action Plans (NCCAPs 2013–2017, 2018–2022, 2023–2027)*, the *National Adaptation Plan (NAP 2015–2030)*, the *Updated Nationally Determined Contribution (NDC 2020)*, the *Long-Term Low Emission Development Strategy (LT-LEDS 2022)*, and complementary frameworks such as the *National Climate Change Framework Policy (2016)*, the *Green Economy Strategy and Implementation Plan (GESIP 2016–2030)*, and the *draft Climate Change Bill (2023)*. Together, these instruments translate Kenya's international commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement into actionable national strategies, ensuring that climate action is embedded in the country's long-term development vision.

The *Climate Change Act (2016)* remains the cornerstone of Kenya's climate policy regime. It provides a legally binding framework for mainstreaming climate change across all sectors, establishes the National Climate Change Council, chaired by the President, to guide implementation, and creates the Climate Change Fund to finance adaptation and mitigation interventions. The three *National Climate Change Action Plans* have served as operational blueprints for translating these commitments into measurable objectives, outlining adaptation and mitigation priorities in key sectors, such as agriculture, water, energy, forestry, and infrastructure. Each successive NCCAP has expanded in scope: the 2013–2017 plan focused on institutional coordination and capacity building, the 2018–2022 plan emphasized green growth and resource mobilization, and the 2023–2027 plan integrates private-sector engagement, technology transfer, and climate data systems. The *National Adaptation Plan (2015–2030)* complements these frameworks by providing a long-term vision for building resilience in climate-sensitive sectors and guiding both national and county governments in adaptation planning. Meanwhile, the *Updated Nationally Determined Contribution (2020)* and *Long-Term Low Emission Development Strategy (2022)* articulate Kenya's global climate ambitions, pledging a 32 percent reduction in greenhouse gas emissions by 2030 and outlining a pathway toward net-zero emissions by 2050.

Academic and policy analyses indicate that these frameworks exhibit strong alignment with Kenya's development priorities and innovation-scaling needs. According to Thorpe and Whitfield (2023), Kenya's climate policies represent one of the most coherent attempts in sub-Saharan Africa to institutionalize climate governance, integrating mitigation, adaptation, and financing within a single legal framework. Similarly, Ampaire et al. (2020) note that Kenya's approach is characterized by high political commitment and relatively strong stakeholder inclusion, particularly through county-level structures. The *National Climate Change Action Plans* explicitly link climate resilience with agricultural productivity, renewable energy adoption, and private-sector innovation—all of which are central to scaling technologies and practices within food, land, and water systems. However, the Food and Agriculture Organization (FAO 2022) and Leeuwis et al. (2021) emphasize that while the policy intent is

progressive, the degree of operational alignment with innovation-scaling mechanisms remains uneven. Earlier frameworks prioritized policy formulation and coordination rather than creating institutional incentives, market mechanisms, or financing models necessary for sustained scaling.

Kenya's political commitment to climate action is consistently characterized as high, reflected in the establishment of a presidentially chaired council and integration of climate priorities into the national development agenda. Financial commitment, however, is relatively moderate. While the Climate Change Fund and the Climate Finance Policy (2016) were designed to enhance domestic resource mobilization, implementation has been constrained by limited capitalization and reliance on international partners. The World Bank (2023) reports that only about 2–3 percent of Kenya's national budget is currently climate-tagged, and disbursement rates for adaptation funds remain low due to bureaucratic inefficiencies and capacity constraints. County governments, which are responsible for implementing much of Kenya's adaptation agenda, often lack the fiscal autonomy and technical capacity required to operationalize climate mandates effectively (Ampaire et al. 2020).

Despite this robust policy foundation, systemic challenges continue to impede Kenya's ability to translate climate frameworks into large-scale, sustainable impact. Studies highlight persistent institutional fragmentation, with overlapping mandates between ministries and agencies leading to coordination inefficiencies (Thorpe and Whitfield 2023). Monitoring, evaluation, and learning systems embedded in the NCCAPs and NAP are insufficiently linked to national budget processes, undermining evidence-based planning and accountability. Furthermore, while many frameworks reference stakeholder participation and user demand, few include mechanisms to systematically capture the needs of farmers, private enterprises, and local innovators who are central to scaling adaptation solutions (Brooks, Zuo, and Hounkonnou 2022). These gaps have resulted in a policy environment that is conceptually aligned with innovation scaling but still limited in its practical capacity to deliver systemic transformation.

Overall, Kenya's climate policy frameworks provide a solid institutional and strategic foundation for scaling innovations in climate-smart agriculture, renewable energy, and resource management. They demonstrate strong policy alignment, high political will, and evolving institutional maturity. Yet, as the literature underscores, the primary challenge lies in moving from policy design to effective implementation, ensuring that governance coherence, sustainable financing, and adaptive learning systems translate Kenya's extensive climate policy architecture into tangible, inclusive, and scalable climate solutions.

### 2.3. Sector-Specific Policies

While Kenya's overarching climate frameworks provide a solid institutional and legal foundation, the country's progress toward climate-resilient and low-emission development ultimately depends on how these principles are embedded in sector-specific policies and subsectoral strategies. These policies translate national ambitions into actionable priorities within the core systems that sustain the economy—agriculture, forestry and land use, water, energy, and transport—each of which faces unique climate vulnerabilities and opportunities for innovation scaling. These sectors form the backbone of Kenya's climate adaptation and mitigation agenda, accounting for the majority of greenhouse gas emissions, natural resource use, and livelihood dependencies (GoK 2022; World Bank 2023).

This section draws on the policy inventory, which identified 21 sector-related instruments, and on peer-reviewed literature to examine how Kenya's sectoral policies address climate resilience, coordination, financing, and innovation scaling. It evaluates how key frameworks, including the *Climate-Smart Agriculture Strategy (2017–2026)*, *Forest Conservation and Management Act (2016)*, *Water Act (2016)*, and *Energy Act (2019)*, translate national climate goals into operational mechanisms that drive systemic change. The analysis is structured across five subsectors—agriculture and food security, forestry and land use, water, energy, and transport—assessing their coherence, institutional arrangements, and financing models. By situating the policy inventory within current academic and policy literature, the section provides an integrated assessment of how sectoral frameworks enable or constrain innovation scaling in Kenya's transition toward a climate-resilient and low-carbon economy.

### 2.4. Agriculture, Livestock, and Food Security

Agriculture remains the cornerstone of Kenya's economy, contributing approximately 21.8 percent of GDP and employing nearly one-third of the national workforce (KNBS 2023). Yet it is also the sector most exposed to climate variability, with over 98 percent of production dependent on rainfall and highly sensitive to droughts and temperature fluctuations (FAO 2022). The policy inventory identified six major policy instruments within this subsector that directly address climate adaptation, resilience, and sustainable agricultural transformation: the *National Agricultural Policy (2012)*, *Climate-Smart Agriculture Strategy (2017–2026)*, *Climate-Smart Agriculture Implementation Framework (2018–2027)*, *Agricultural Sector Transformation and Growth Strategy (ASTGS 2019–2029)*, *National Livestock Policy (2013)*, and the *Drought Risk Management and Ending Drought Emergencies Framework (2013)*. Together, these frameworks represent Kenya's most comprehensive attempt to align agricultural growth with climate resilience and food security objectives.

The *Climate-Smart Agriculture (CSA) Strategy (2017–2026)* serves as the principal framework for integrating climate adaptation and mitigation into agricultural systems. It promotes sustainable intensification through improved seed systems, soil and water conservation, agroforestry, and access to climate information services. The *CSA Implementation Framework (2018–2027)* operationalizes this vision by clarifying institutional roles, identifying financing pathways, and embedding CSA priorities into national and county planning. These two instruments are complemented by the *ASTGS (2019–2029)*, which broadens the climate agenda to encompass productivity, value-chain competitiveness, digital agriculture, and job creation, thereby linking resilience to inclusive growth and market transformation (MoALFC 2019).

The *National Livestock Policy (2013)* and the *Drought Risk Management and Ending Drought Emergencies (EDE) Framework (2013)* expand this focus to arid and semi-arid lands (ASALs), where pastoral livelihoods are most affected by climate shocks. These frameworks prioritize drought-risk reduction, livestock insurance, feed systems, and rangeland management, aligning closely with the CGIAR's research agenda on resilience and adaptive capacity (Herrero et al. 2016). Evidence shows that while the EDE Framework catalyzed important coordination efforts through the National Drought Management Authority (NDMA), financing and institutional continuity remain significant challenges (NDMA 2021; World Bank 2023).

Scholarly literature highlights several persistent implementation gaps across Kenya's agricultural climate frameworks. Despite well-articulated adaptation objectives, many policies lack explicit financing mechanisms and measurable indicators for scaling innovations (Radeny et al. 2019). County governments, which carry much of the implementation burden under devolution, often face limited fiscal and technical capacity to operationalize national CSA priorities (Republic of Kenya 2022). Furthermore, while policies such as the ASTGS and CSA Strategy emphasize private-sector participation and farmer-led innovation, in practice, coordination between research institutions, extension services, and agribusinesses remains weak (Faling 2020; Lipper et al. 2014).

Nonetheless, Kenya's agriculture and food security frameworks demonstrate medium-to-high alignment with innovation-scaling principles. They embed adaptive management, emphasize evidence-based decision-making, and recognize the importance of cross-sector linkages, particularly between water, energy, and food systems. The growing focus on CSA and digital agriculture indicates a clear policy shift toward integrating technology, finance, and data for resilience and productivity gains. Overall, the policy ecosystem provides a strong normative foundation for climate-smart transformation but requires enhanced coherence, sustainable financing, and capacity development at subnational levels to move from pilot success to nationwide scaling.

## Forestry and Land Use

Forestry and land use play a central role in Kenya's climate agenda, both as a carbon sink and as a foundation for rural livelihoods. Forests cover approximately 8.8 percent of Kenya's total land area, yet deforestation and land degradation continue to undermine ecosystem resilience and increase greenhouse gas emissions (FAO 2022; KFS 2023). The policy inventory identified five key instruments under this thematic area: the *Forest Policy (2014)*, *Forest Conservation and Management Act (2016)*, *National REDD+ Strategy (2016–2030)*, *Forest and Landscape Restoration Implementation Plan (2021–2030)*, and *National Biodiversity Strategy and Action Plan (2010–2020)*. Together, these frameworks define the legal, institutional, and operational mechanisms for sustainable forest management, carbon sequestration, biodiversity conservation, and land restoration.

The *Forest Conservation and Management Act (2016)* provides the core legal framework for forest governance, decentralizing forest management to county levels and promoting participatory forest conservation through Community Forest Associations. It operationalizes the principles outlined in the *Forest Policy (2014)*, which emphasizes community engagement, equitable benefit-sharing, and private-sector participation. Complementing these, the *National REDD+ Strategy (2016–2030)* aligns Kenya's forest sector with global climate commitments by introducing mechanisms for reducing emissions from deforestation and forest degradation, enhancing carbon stocks, and accessing carbon finance. The *Forest and Landscape Restoration Implementation Plan (2021–2030)* sets out to restore 5.1 million hectares of degraded land under the AFR100 and Bonn Challenge, underscoring Kenya's regional leadership in restoration efforts.

Research highlights that despite this strong policy architecture, implementation remains uneven due to institutional overlap between the Kenya Forest Service (KFS), county governments, and environmental authorities (Okumu et al. 2021). Financing gaps persist: forest sector funding remains below 2 percent of national budget allocations while benefit-sharing and monitoring mechanisms are still underdeveloped (World Bank 2023). Studies further note that while frameworks such as the REDD+ Strategy have opened new financing avenues through carbon markets, limited technical capacity and complex verification procedures constrain broader participation (Atela et al. 2018). Nevertheless, Kenya's forestry and land use policies exhibit high alignment with innovation-scaling principles. They explicitly promote multi-stakeholder partnerships, devolved management, and nature-based solutions that support the climate-smart agenda. The emphasis on restoration, carbon finance, and inclusive governance positions this sector as a critical enabler of low-carbon, climate-resilient development.

## Water

Water resource management remains one of Kenya's most decisive arenas for climate resilience, food security, and economic growth. The sector underpins nearly every productive system, yet Kenya's freshwater availability stands at less than 650 m<sup>3</sup> per capita annually, well below the global water scarcity threshold of 1,000 m<sup>3</sup> (World Bank 2023). Agriculture, which consumes more than 70 percent of all withdrawals, is acutely vulnerable to erratic rainfall and recurrent droughts (FAO 2022). The inventory identifies three major frameworks anchoring Kenya's climate-water governance: the *National Water Policy* (2012, update in progress), the *Water Act* (2016), and the *Water Sector Climate Change Response Strategy* (post-2016). Together, they establish the legislative, institutional, and strategic foundation for integrated water resource management (IWRM), irrigation expansion, and climate-proof infrastructure.

The *Water Act 2016* operationalizes the 2010 Constitution's devolution principles by clearly separating national oversight from county service delivery. It created the Water Resources Authority (WRA) for basin-level regulation and the Water Services Regulatory Board (WASREB) for utility oversight, while devolving rural and small-town water supply to counties. Empirical studies show that this framework has improved regulatory clarity and stakeholder participation at the catchment scale, yet persistent fiscal and capacity constraints impede implementation. Mogaka et al. (2017) found that only a handful of catchment-management plans were fully financed, and many lacked monitoring systems linking hydrological data to county budgeting. The *National Water Policy 2012*—now under revision—provides the overarching strategy for equitable access and resource sustainability but predates key climate-adaptation commitments. Its update is expected to better integrate IWRM with adaptation planning, groundwater management, and disaster-risk reduction (Republic of Kenya 2023).

The *Water Sector Climate Change Response Strategy* explicitly connects climate adaptation to water security, identifying priority measures such as aquifer recharge, flood-management infrastructure, and climate-resilient water harvesting (MoWSI 2018). Case studies of managed aquifer-recharge pilots in Kitui and Makueni show how locally designed recharge ponds have stabilized dry-season supplies and strengthened community institutions, yet the absence of long-term financing has limited replication (GWP 2021). Similarly, the expansion of small-scale irrigation under programs like the Kenya Climate-Smart Agriculture Project has demonstrated yield gains and income diversification, but fragmented policy oversight between irrigation, environment, and agriculture agencies has reduced efficiency in resource allocation (Mutua et al. 2020).

Academic literature widely agrees that Kenya's water frameworks exhibit strong normative alignment but uneven operational depth. The integration of IWRM principles and climate-risk considerations is consistent with international best practice (UNDP 2022), yet policy coherence across agencies remains a challenge. Oduor and Mutua (2019) note overlapping mandates among the Ministry of Water, NEMA, and county authorities, producing coordination fatigue and slowed project delivery. Financing shortfalls compound the issue: less than 5 percent of national agricultural spending is directed to irrigation infrastructure, and many basin boards rely heavily on donor-supported projects rather than recurrent budget allocations (World Bank 2023).

Nonetheless, the sector's policy architecture offers a robust platform for scaling water-related innovations. Kenya's growing portfolio of blended-finance models for smallholder irrigation, such as those piloted under the World Bank's *Financing Locally Led Climate Action Program* and the *Kenya Climate-Smart Agriculture Project*, illustrates how regulatory certainty can unlock private investment in adaptive infrastructure. Integrating these models with stronger hydrological data systems and devolved planning could transform water policy from a regulatory instrument into a catalyst for climate-resilient agricultural scaling. In sum, while Kenya's water sector policies provide a comprehensive and adaptive framework, realizing their potential will depend on deepened coordination, sustainable financing, and the institutional capacity to translate planning into inclusive, climate-proof outcomes.

## Energy Sector

Energy lies at the center of Kenya's ambition to achieve climate-resilient growth and inclusive economic transformation. As a critical enabler of productivity, energy access determines whether innovations in irrigation, agro-processing, storage, and logistics can move from pilot scale to widespread adoption. Kenya's dependence on rainfed agriculture and vulnerability to recurrent droughts make energy, particularly renewable and decentralized systems, an essential ingredient for adaptation. The country's policy framework reflects this strategic importance: the inventory identified six core national instruments—the *National Energy Policy* (2018), *Energy Act* (2019), *Kenya National Energy Efficiency and Conservation Strategy* (2020), *Bioenergy Strategy* (draft), *Geothermal Development Policy*, and *Feed-in Tariff Policy*—together with two complementary and emerging frameworks, the *National Cooling Action Plan* (2022) and *E-Mobility Strategy* (2023). Collectively, they anchor Kenya's transition toward sustainable, affordable, and low-carbon energy systems while linking energy development to food and livelihood outcomes.

The *Energy Act (2019)* serves as the legal foundation of Kenya's energy governance system. It consolidates previous legislation to provide a coherent framework for generation, distribution, and regulation while establishing the Energy and Petroleum Regulatory Authority (EPRA) and the Rural Electrification and Renewable Energy Corporation (REREC) as lead implementing bodies. It also mandates the promotion of renewable energy, energy

efficiency, and rural electrification, creating clear institutional mandates for public and private actors alike. Complementing this, the *National Energy Policy (2018)* provides a long-term vision for diversification and reliability across the energy mix, with explicit recognition of the role of energy in enabling agricultural modernization, water management, and industrial value addition. The *Kenya National Energy Efficiency and Conservation Strategy (2020)* further operationalizes this vision by setting energy-use benchmarks and performance standards across major sectors, including agro-processing, cold storage, and irrigation.

These frameworks are tightly linked to Kenya's international commitments under the Paris Agreement, Agenda 2063, and the Sustainable Development Goals (SDGs 7 and 13). They seek to balance climate mitigation with adaptation, emphasizing that access to clean, reliable energy is not just a goal in itself but a prerequisite for resilience. According to the International Energy Agency (2023), more than 80 percent of Kenya's electricity generation already comes from renewable sources, chiefly, geothermal, wind, and hydropower, making it one of the cleanest power grids globally. Yet, despite these achievements, access disparities persist: roughly 25 percent of rural households and a large share of smallholder farmers remain unconnected to reliable electricity (World Bank 2023). This uneven access creates spatial inequalities in innovation adoption, as many rural entrepreneurs cannot power irrigation, mechanization, or storage technologies essential for scaling productivity.

Empirical research demonstrates that access to renewable energy directly influences the viability and scalability of agricultural innovations. Evaluations of Kenya's off-grid and mini-grid programs under the Green Mini-Grid (GMG) initiative show that when electricity access is coupled with productive-use financing and capacity development, rural businesses expand, agricultural processing increases, and local employment rises (Taneja et al. 2022; Cross & Neumayer 2021). Solar-powered irrigation initiatives, such as those piloted in Machakos and Garissa counties, have demonstrated yield increases of up to 150 percent and reduced diesel dependence by 60 percent, while empowering women and youth-led enterprises that manage shared irrigation systems (Murray et al. 2020). These examples illustrate that Kenya's enabling policies can translate directly into livelihood gains when supported by targeted finance, institutional coordination, and research-practice linkages.

However, the same body of literature underscores persistent structural gaps between policy ambition and practical implementation. Despite clear legislative and strategic direction, coordination among ministries and agencies, notably those responsible for energy, water, and agriculture, remains limited, resulting in fragmented investments and overlapping mandates (Gannon et al. 2023; Republic of Kenya 2022). Financing shortfalls are another constraint: while the Feed-in Tariff Policy attracted significant private investment in large-scale renewable generation during its early phase, it has not evolved into a mechanism suitable for small and medium-scale producers, nor has it adequately addressed affordability challenges for off-grid users. The *Bioenergy Strategy* remains in draft form, constraining efforts to formalize sustainable biomass production and biofuel use—both critical for rural households and agri-processing. Moreover, gender, youth, and social inclusion considerations, though referenced in policy texts, are weakly mainstreamed in financing instruments and project delivery (UNDP 2021).

The policy architecture, nonetheless, exhibits high coherence with innovation-scaling objectives, particularly through its cross-sector linkages. The *National Cooling Action Plan (2022)* connects energy policy to Kenya's nutrition and food security goals by promoting efficient cold chains that reduce post-harvest losses, which are estimated to account for 20–30 percent of perishable food loss annually (FAO 2022). Similarly, the *E-Mobility Strategy (2023)* introduces low-emission transport solutions that can reduce logistics costs and greenhouse gas emissions in agri-value chains, strengthening Kenya's role as a regional leader in green technology adoption. These newer frameworks illustrate a shift from traditional supply-focused energy policy to a demand-oriented, systems-based approach, directly supporting CGIAR's emphasis on enabling environments that bridge research, policy, and end-user needs.

In summary, Kenya's energy sector policies provide a strong legislative and strategic foundation for scaling innovations across food, land, and water systems. They demonstrate clear political commitment and alignment with climate and development goals, yet face gaps in implementation, financing, and coordination. Strengthening institutional linkages among sectors, expanding blended and concessional finance for productive energy use, and enhancing county-level technical capacity will be critical to translate the country's renewable energy leadership into widespread adaptation and livelihood benefits. The energy policy ecosystem thus represents both a cornerstone and a test case for how enabling environments can convert technological potential into transformative, inclusive climate action.

## Transport Sector

Transport remains one of the most influential yet under-analyzed levers for scaling innovation in Kenya's food, land, and water systems. Efficient, low-carbon logistics determine whether smallholders can access markets, whether perishable produce reaches consumers on time, and how resilient rural economies are to climate shocks. Kenya's transport sector contributes roughly 11 percent of total greenhouse gas emissions, primarily from road freight and urban traffic, but it also presents one of the country's greatest opportunities for inclusive, green transformation (IEA 2023; UNEP 2023). The policy inventory identifies three key frameworks that define this landscape: the *Integrated National Transport Policy (2009)*, currently under revision, the *National Sustainable Waste Management Policy (2021)*, and the *Draft E-Mobility Policy (2023)*. Together, these form the strategic and

regulatory backbone for decarbonizing logistics, strengthening supply chains, and linking climate adaptation with economic competitiveness.

The *Integrated National Transport Policy (2009)* provides the overarching framework for developing a safe, efficient, and affordable transport system. It recognizes transport as a cross-cutting enabler for agriculture, industry, and trade, emphasizing connectivity between production zones and markets. However, it predates Kenya's *Climate Change Act (2016)* and *Vision 2030 Medium-Term Plans*, and is currently under review to integrate climate mitigation, resilience, and low-emission development. The updated policy aims to align with the *Green Economy Strategy and Implementation Plan (2016–2030)* and Kenya's *Nationally Determined Contribution (2020)*, signaling a shift from infrastructure expansion to sustainability and efficiency as guiding principles. Complementing this is the *National Sustainable Waste Management Policy (2021)*, which promotes circular economy approaches, resource efficiency, and low-carbon waste logistics—critical for reducing emissions and environmental degradation along food value chains.

The *Draft E-Mobility Policy (2023)* represents the most forward-looking element of Kenya's transport transition. It envisions an ecosystem where electric mobility supports affordable, clean, and connected transport for both urban and rural areas. The policy outlines fiscal incentives for electric vehicle (EV) imports, local manufacturing, and charging infrastructure; proposes technical standards for batteries and grid integration; and seeks to anchor Kenya's role as a regional hub for e-mobility innovation. Case studies demonstrate that the private sector is already moving ahead—companies like BasiGo, Roam Electric, and Kiri EV have introduced electric buses and motorcycles, reducing operating costs by up to 40 percent while cutting emissions and noise pollution (Odhiambo et al. 2022). These developments show how public–private collaboration, supported by clear policy direction, can accelerate Kenya's climate and industrial policy goals simultaneously.

The literature consistently highlights that transport inefficiency remains a major constraint to agricultural competitiveness and food security. Poor feeder road networks and unreliable logistics increase post-harvest losses—estimated at 30 to 40 percent for perishable produce in some counties (World Bank 2023)—and limit the scalability of agricultural innovations. Studies of rural transport infrastructure in Machakos, Nyandarua, and Uasin Gishu counties reveal that improved connectivity not only enhances market access but also encourages adoption of productivity-enhancing technologies such as solar irrigation, mechanization, and digital extension services (FAO 2022; Mutua et al. 2021). In this sense, sustainable transport policies are integral to innovation scaling: they determine the physical and economic reach of climate-smart technologies, shaping both supply and demand dynamics across Kenya's agricultural systems.

Despite these positive shifts, implementation challenges persist. Institutional fragmentation across ministries (i.e., transport, environment, energy, and industrialization) has slowed the creation of integrated frameworks for low-carbon logistics. Financing mechanisms for e-mobility remain nascent, relying heavily on donor and private-sector initiatives rather than domestic budget lines. Moreover, while urban mobility has received substantial attention, rural transport systems, especially those linking smallholder production zones to aggregation and processing centers, remain weakly integrated into national climate and development strategies. Addressing these gaps requires a deliberate focus on last-mile logistics, infrastructure maintenance, and local financing models for green transport solutions.

Kenya's emerging transport policy landscape thus presents both a challenge and an opportunity for the S4I agenda. The coherence between industrial policy, climate objectives, and rural development goals is improving, but still fragile. Strengthening the enabling environment for transport innovation—through targeted incentives for clean logistics, enhanced public–private partnerships, and mainstreaming transport into climate adaptation and agricultural programs—would directly support S4I's impact areas of livelihoods and jobs. The evolution of transport policy from a narrow infrastructure agenda to an integrated sustainability strategy will be a key determinant of whether Kenya can achieve climate-smart, inclusive, and innovation-driven growth in the coming decade.

## 2.5. Disaster Risk Reduction and Resilience Frameworks

Kenya's disaster risk reduction (DRR) and resilience frameworks form the connective tissue between climate adaptation policy and operational risk management across sectors. The inventory identified six national-level instruments central to this domain: the *National Disaster Management Policy (2023)*, the *National Drought Management Authority (NDMA) Act (2016)*, the *National Disaster Risk Financing Strategy (2020)*, the *National Contingency Plan (2022)*, the *Disaster Risk Reduction Strategy (2018–2022)*, and the *Kenya Drought Risk Management and Ending Drought Emergencies (EDE) Strategy (2013–2022)*. Together, these frameworks position Kenya as a regional leader in institutionalizing climate-related disaster governance through early warning, anticipatory financing, and resilience-building mechanisms.

The *National Disaster Management Policy (2023)* provides the most recent umbrella framework, aligning Kenya's risk governance system with the *Sendai Framework for Disaster Risk Reduction (2015–2030)*. It aims to strengthen national and county coordination, establish risk-informed planning systems, and integrate climate information services into decision-making. The *NDMA Act (2016)* institutionalized the *National Drought Management Authority*, creating a permanent mechanism to coordinate drought risk management across Kenya's

23 arid and semi-arid counties. Empirical studies show that the NDMA's early warning and response systems have improved the timeliness of interventions, reducing drought-related losses by up to 30 percent in pilot counties (Kihiu et al. 2022). The *National Disaster Risk Financing Strategy* complements these efforts by outlining financing tools—such as contingency funds, insurance mechanisms, and shock-responsive social protection—to ensure rapid resource mobilization during climate shocks.

Despite these advances, implementation challenges persist. Literature underscores that Kenya's resilience frameworks remain moderately aligned with innovation scaling objectives but often siloed from development planning and private-sector engagement (World Bank 2023). Coordination between humanitarian, climate, and agricultural financing streams is still weak, and risk information is not consistently integrated into planning processes. For example, although the *Ending Drought Emergencies (EDE) Strategy* was pivotal in mainstreaming resilience-building, its sunset in 2022 left an institutional vacuum that the *National Disaster Management Policy (2023)* now seeks to fill. Strengthening linkages between DRR systems and innovation scaling, such as climate-smart insurance, climate information services, and adaptive safety nets, will be key to realizing the transformative potential of these frameworks.

## 2.6. County-Level Climate Instruments

Kenya's devolved system of governance has significantly redefined the institutional architecture for climate action and innovation scaling. Since devolution in 2013, county governments have gained authority over key functions—agriculture, water, natural resource management, and local economic development—placing them at the frontlines of climate adaptation and resilience planning. The policy inventory identified five main county-level climate instruments: *County Climate Change Acts* (e.g., Makueni, Kisumu, and Wajir), *County Climate Change Funds (CCCFs)*, *County Climate Change Action Plans (CCCAPs)*, *County Climate Fund Regulations (2017 Model Framework)*, and the integration of *Climate Action in County Integrated Development Plans (CIDPs, 2018–2023 and 2023–2027)*. Together, these frameworks form the foundation for locally-led adaptation and decentralized climate finance—an emerging best practice that has positioned Kenya as a continental leader in subnational climate governance (Adaptation Consortium 2021; Njeri et al. 2022).

The devolution of climate governance was institutionalized through the *Climate Change Act (2016)*, which mandates both national and county governments to integrate climate change considerations into planning, budgeting, and implementation. Counties responded by enacting their own *County Climate Change Acts*, establishing legal mandates for climate units, funds, and multi-stakeholder planning committees. Makueni County pioneered this approach in 2015, creating the first legally established *County Climate Change Fund (CCCF)* in Africa, which earmarks at least 1% of the county's annual budget for locally identified adaptation projects (Hesse & Pattison 2019). Studies by the International Institute for Environment and Development (IIED 2022) and the ADA Consortium (2023) show that counties with climate acts and CCCFs—such as Makueni, Kitui, Garissa, and Wajir—demonstrate higher institutional capacity, budgetary predictability, and citizen participation in decision-making compared to those without.

The *CCCF mechanism* has emerged as one of Kenya's most influential models for devolved climate finance. By combining participatory planning, fiscal devolution, and performance-based disbursement, CCCFs enhance local ownership and responsiveness to community priorities (Hesse et al. 2020; UNDP 2021). Empirical assessments show that counties using CCCFs have mobilized additional donor co-financing, particularly under the *Financing Locally-Led Climate Action (FLLoCA) Program*, and have delivered over 400 community-driven adaptation investments across 14 counties (World Bank 2023). These include small-scale irrigation schemes, rangeland rehabilitation, and water harvesting infrastructure, directly addressing livelihood vulnerabilities while creating opportunities for scaling local innovations. However, studies also highlight challenges in institutional sustainability once external funding declines, as well as limited technical capacity for climate data management and project monitoring at the county level (Nash et al. 2022; IIED 2023).

The integration of climate priorities into *CIDPs* represents another key step in mainstreaming adaptation. *CIDPs* are five-year strategic frameworks that guide all county investments and align them with national development plans. The *Climate Change Act (2016)* and *National Climate Change Action Plan (NCCAP 2018–2022)* mandated counties to include climate resilience measures and adaptation targets within their *CIDPs*. Empirical analyses by the African Centre for Technology Studies (ACTS 2021) and NEMA (2022) found that over 70 percent of counties incorporated climate considerations into their 2018–2023 *CIDPs*, though only about one-third allocated dedicated funding or established climate units to oversee implementation. Counties with established CCCFs or climate acts were more likely to demonstrate integration of cross-sectoral adaptation priorities, especially in agriculture and water sectors, indicating that legal and fiscal instruments significantly improve mainstreaming outcomes.

Similarly, *CCCAPs* have operationalized locally led adaptation by identifying area-specific climate risks and aligning subnational priorities with national frameworks such as the *National Adaptation Plan (2015–2030)* and *NDC (2020)*. Research by the Adaptation Research Alliance (ARA 2023) notes that *CCCAPs* have enhanced vertical coherence between national and county climate agendas, though coordination challenges persist due to overlapping mandates between environment, agriculture, and finance departments. Moreover, the effectiveness of *CCCAPs* varies depending on local leadership commitment and availability of technical expertise (Njeri et al. 2022).

The evidence underscores that devolved climate governance has advanced Kenya's localization of adaptation and innovation scaling. Policy alignment is strong: county frameworks such as the County Climate Change Acts, CCCFs, and CIDs mirror national priorities established under the *Climate Change Act of 2016*, the *National Adaptation Plan (2015–2030)*, and successive *NCCAPs*, while tailoring implementation to local contexts (Adaptation Consortium 2021; Njeri et al. 2022). Political and financial commitment is evident through county-level legislation and regular budget allocations to CCCFs, complemented by the World Bank–supported *FLLoCA* program, which channels performance-based grants to counties meeting transparency and planning standards (World Bank 2023). However, long-term fiscal sustainability still depends heavily on national transfers and donor co-financing (IIED 2022). Enabling factors identified in the literature include institutionalized participatory mechanisms such as ward planning committees and public investment prioritization processes, which have strengthened local ownership, responsiveness, and social cohesion in adaptation investments (Hesse and Pattison 2019; UNDP 2021). Yet, implementation gaps persist—particularly weak climate data systems, limited coordination between sectoral departments, and insufficient monitoring capacity—which continue to constrain the scalability of locally driven innovations to achieve national impact (IIED 2022; World Bank 2023).

In sum, Kenya's county-level climate instruments represent one of the most advanced models of devolved adaptation in Africa. They demonstrate how policy coherence, fiscal decentralization, and citizen engagement can together form an enabling environment for innovation scaling. Strengthening their integration with national financing mechanisms, research partnerships, and monitoring frameworks, particularly through programs such as S4I, offers a promising pathway for building climate-resilient, evidence-driven local economies.

## 2.7. Emerging Frameworks

Kenya's climate policy landscape is evolving rapidly, with new frameworks reflecting a shift from adaptation-focused planning toward integrated climate–industrial development. The policy inventory captured five emerging or draft instruments—the *Climate Change (Amendment) Bill (2023)*, *Carbon Markets Regulations (2024)*, *National Green Hydrogen Strategy (2023)*, *National Cooling Action Plan (2022)*, and *E-Mobility Strategy (2023)*—each representing a frontier of regulatory and technological innovation. Collectively, these frameworks mark a strategic policy inflection: linking decarbonization with industrial competitiveness, investment attraction, and technology transfer in line with global commitments under the *Paris Agreement* and *African Union Climate Strategy 2022–2032* (UNEP 2023; SEI 2023).

The *Climate Change (Amendment) Bill (2023)* proposes to strengthen Kenya's climate governance architecture by clarifying institutional mandates, mainstreaming carbon markets within the *Climate Change Act (2016)*, and formalizing benefit-sharing mechanisms for communities engaged in emission-reduction projects. According to the Ministry of Environment, Climate Change and Forestry (2023), the amendments aim to align domestic law with Article 6 of the Paris Agreement, establishing Kenya among the first African nations to regulate voluntary carbon trading under a national legal framework. The accompanying *Carbon Markets Regulations (2024)*, gazetted by the National Treasury, introduce requirements for project registration, third-party verification, and equitable revenue allocation to counties and communities. Empirical analysis by the African Carbon Markets Initiative (ACMI 2024) and the Kenya Climate Innovation Center (KCIC 2023) suggests that these measures could unlock up to USD 600 million annually in carbon finance by 2030, particularly through agroforestry, clean cooking, and renewable energy projects. However, early studies caution that institutional readiness, monitoring, and safeguards for local equity remain underdeveloped (Gold Standard Foundation 2024; SEI 2023).

The *National Green Hydrogen Strategy (2023)* represents another cornerstone of Kenya's emerging low-carbon industrial agenda. Building on Kenya's strong renewable energy base, where over 90 percent of electricity already derives from clean sources (IRENA 2023), the strategy envisions positioning Kenya as a regional hub for green hydrogen production and export. It prioritizes investments in electrolyzer infrastructure, port logistics, and research partnerships to integrate hydrogen into fertilizer production, transport, and industrial heat processes (Government of Kenya 2023; UNEP 2024). Studies by the International Energy Agency (IEA 2023) and the Africa Energy Transition Initiative (AETI 2024) highlight Kenya's comparative advantage in cost-effective renewable generation and strategic access to maritime trade routes, though they note that financing, storage, and regional coordination will determine feasibility.

Similarly, the *E-Mobility Strategy (2023)* and *National Cooling Action Plan (2022)* extend Kenya's climate transition into energy demand sectors. The *E-Mobility Strategy* promotes the electrification of transport through fiscal incentives, domestic manufacturing, and charging infrastructure. It aims to reduce fossil fuel imports, improve urban air quality, and lower transport emissions by 15 percent by 2030 (Ministry of Transport 2023). Pilot projects by firms such as BasiGo and Roam (formerly Opibus) have demonstrated the feasibility of electric buses and motorcycles in urban centers, supported by concessional finance and battery-swapping innovation (IEA 2024; KIPPRA 2023). The *National Cooling Action Plan (2022)*, meanwhile, addresses rising energy and food system vulnerabilities linked to heat stress. It targets a 30 percent improvement in cooling efficiency and expansion of sustainable cold chains for agriculture and health systems (Ministry of Energy 2022). Research by FAO (2022) and Sustainable Energy for All (SEforALL 2023) underscores that efficient cold-chain development can reduce post-harvest losses by up to 40 percent in horticultural value chains—an essential component of Kenya's nutrition and livelihood goals.

While these frameworks remain in early stages of implementation, they signal a new phase in Kenya's enabling environment for innovation scaling—one that integrates climate ambition with industrial competitiveness and investment mobilization. The emerging policy focus on carbon markets, e-mobility, and green hydrogen illustrates a shift toward *mitigation-linked economic transformation*, expanding the scope of climate governance beyond adaptation. The literature converges on the finding that Kenya's evolving frameworks embody strong political will, regional leadership, and the potential to attract significant private investment; however, sustained progress will depend on coherent regulatory enforcement, institutional capacity strengthening, and equitable benefit-sharing mechanisms to ensure that green industrialization translates into inclusive development outcomes (SEI 2023; UNEP 2024; IEA 2023; ACMI 2024).

## 2.8. Cross-Cutting and Enabling Frameworks

Kenya's cross-cutting and enabling policy frameworks form the backbone of its climate and innovation governance system—defining the institutional, financial, and knowledge conditions under which sectoral policies are implemented. The policy inventory captured nine core instruments under this category: Kenya Vision 2030, the Bottom-Up Economic Transformation Agenda (BETA, 2022–2027), the Medium-Term Plan IV (2023–2027), the Science, Technology and Innovation (ST&I) Policy (2019), the Public Finance Management (PFM) Act (2012), the Public–Private Partnership (PPP) Act (2021), the National Policy on Gender and Development (2019), the National Youth Policy (2018), and the Digital Economy Blueprint (2019). Together, these policies determine the coherence, financing, and inclusiveness of Kenya's enabling environment for scaling innovation in food, land, and water systems.

Kenya Vision 2030 and its medium-term implementation frameworks represent the country's longest-standing national development agenda. Vision 2030 identifies agriculture, energy, water, and infrastructure as economic pillars, while embedding climate change adaptation and low-carbon development as cross-cutting priorities (Government of Kenya 2023). The Bottom-Up Economic Transformation Agenda (BETA) builds on this legacy, emphasizing inclusive growth, value addition, and climate-resilient production systems that generate jobs in rural and urban economies. Empirical studies suggest that Vision 2030 and subsequent Medium-Term Plans (MTPs) have provided Kenya with policy continuity and a strong results-based planning culture (World Bank 2023; OECD 2022). However, challenges remain in translating these high-level commitments into actionable coordination mechanisms between ministries and county governments (Njiru & Ngure 2022). Weak horizontal coherence—where ministries operate in silos—and inconsistent vertical integration with devolved units limit the ability to scale innovations across administrative levels. The MTP IV (2023–2027) seeks to address these gaps by embedding climate, resilience, and innovation outcomes into Kenya's national performance and budget monitoring framework, reinforcing alignment with global commitments under the Sustainable Development Goals (SDGs) and Paris Agreement.

The Science, Technology and Innovation Policy (2019) and the Digital Economy Blueprint (2019) represent Kenya's strongest enablers of research-based scaling. The ST&I Policy envisions transforming Kenya into a knowledge-driven economy by linking scientific research with commercialization pathways and industrial uptake. Studies by Kimenyi et al. (2021) and the African Observatory on Science, Technology and Innovation (AOSTI 2022) show that Kenya ranks among Africa's top five in innovation readiness, driven by an active ecosystem of public research institutes (such as KALRO and KEFRI) and private incubators (such as iHub and Nailab). Yet, R&D spending remains around 0.8 percent of GDP—below the African Union's 1 percent target—limiting the diffusion of innovations beyond pilots. The Digital Economy Blueprint complements this agenda by promoting data governance, digital infrastructure, and financial inclusion. Case studies on mobile-enabled agricultural platforms like DigiFarm and iShamba indicate that digitalization can bridge extension gaps and expand access to markets and credit, particularly for women and youth farmers (GSMA 2023; FAO 2022). Integrating these frameworks into climate and agricultural strategies is thus critical to ensuring that scaling efforts are grounded in robust knowledge systems and technology access.

Fiscal and investment frameworks, particularly the Public Finance Management Act (2012) and Public–Private Partnership (PPP) Act (2021), play a pivotal role in determining the resource base for innovation scaling. The Public Finance Management Act institutionalized fiscal decentralization and performance-based budgeting, enhancing transparency and county-level resource control. However, climate financing remains fragmented—spread across sectoral budgets and development partner programs, with weak integration into national and county fiscal systems (Climate Policy Initiative 2023; UNDP 2022). Only about one-quarter of Kenya's climate-related expenditures are domestically funded, underscoring dependence on external grants and loans. The PPP Act (2021) modernized Kenya's investment framework, expanding eligibility for climate-relevant sectors such as irrigation, renewable energy, and waste management, and allowing county governments to enter PPP agreements. Evaluations of projects like the Kenya Off-Grid Solar Access Project (KOSAP) and Climate Smart Agriculture Project (KCSAP) demonstrate that blended finance and PPPs can de-risk private investment and accelerate innovation uptake when supported by clear regulatory and fiscal mechanisms (AfDB 2023; BII 2022). However, literature highlights persistent bottlenecks in institutional capacity, project appraisal, and risk-sharing mechanisms that limit the scalability of these models.

Finally, Kenya's Gender (2019) and Youth (2018) policies ensure that innovation scaling remains socially inclusive. Gender and youth inclusion are recognized not only as equity goals but as productivity enablers in agricultural transformation. Studies have shown that gender-responsive climate programs—such as access to credit, digital tools, and training—can increase technology adoption among women by 20–25 percent and improve household resilience outcomes (Kabeer & Mwangi 2021; Ndiritu et al. 2020). Similarly, youth-focused programs under BETA and the Digital Economy Blueprint promote entrepreneurship and skills development in climate-smart value chains, yet evidence suggests that access to finance and land tenure remains a major barrier for youth participation in scaling efforts (IFAD 2022). Embedding these inclusion frameworks more firmly into climate and innovation policies can thus strengthen system-wide sustainability and ownership.

In summary, Kenya's cross-cutting frameworks demonstrate high policy alignment with national and global innovation-scaling goals but moderate institutional and financial coherence. The literature converges on several findings relevant to this report's objectives: (1) policy alignment is strong at the strategic level, with Vision 2030, BETA, and MTP IV providing coherent direction for climate-resilient development; (2) political commitment is visible in the establishment of enabling fiscal and research frameworks, yet financing and coordination mechanisms remain weak; (3) enabling factors include a vibrant innovation ecosystem and devolved fiscal systems, while gaps persist in research–industry linkages and investment absorption. Strengthening integration between ST&I, PFM, and PPP frameworks, and embedding inclusion and digitalization as structural levers, will be critical to operationalizing Kenya's enabling environment for scaling innovation across food, land, and water systems.

### 3. Findings from the Focus Group Discussion: Validating Climate Policy Priorities for Innovation Scaling

The focus group discussion (FGD) generated rich qualitative evidence on how Kenya's climate policy landscape operates in practice, complementing the inventory review and literature-based analysis with grounded perspectives from policy actors, researchers, and practitioners. The session brought together representatives from the Ministry of Agriculture and Livestock Development, the East African Grain Council, the Kenya Meteorological Department, and Participatory Ecological Land Use Management, alongside researchers working on climate resilience and innovation systems. Their perspectives reinforce the broader scholarly consensus: Kenya has one of Africa's most sophisticated climate policy architectures, yet implementation challenges, institutional fragmentation, and financing constraints persistently undermine the scaling of innovations across food, land, and water systems (Nhamo et al. 2021; Pauw & Thurlow 2017; World Bank 2023).

Participants agreed that the national climate frameworks carry disproportionate weight in determining Kenya's climate trajectory and its ability to scale innovations. The National Climate Change Action Plan (NCCAP), the National Adaptation Plan (NAP 2015–2030), the Updated Nationally Determined Contribution (NDC), and the Climate Change Act (2016, amended 2023) were consistently identified as the “anchor frameworks” in the adaptation and mitigation space. This prioritization closely reflects academic assessments that highlight the NCCAP as Kenya's primary instrument for operationalizing its Paris Agreement commitments and structuring sectoral climate action (Awuor et al. 2022; Omari & Ngonge 2020). Participants emphasized that the ongoing development of the third NCCAP signals sustained political momentum, but also raised concerns about whether implementation will keep pace with Kenya's growing climate risk profile.

The Climate Change Act and its 2023 amendment were viewed as pivotal for shaping emerging issues such as carbon markets and climate finance. The participants' focus on the newly released 2024 Carbon Markets Regulations resonates with a growing body of literature noting Kenya's leadership role in formalizing domestic rules for Article 6 carbon trading (Newell et al. 2023; Castellanos et al. 2024). The workshop highlighted that these regulations have the potential to unlock new private capital flows for agroforestry, land restoration, and clean energy innovations. However, participants argued that these frameworks will only catalyze innovation scaling if operational clarity, transparency, and enforcement capacity are strengthened—echoing concerns raised globally about the governance risks of carbon markets (Atela et al. 2018; Röver et al. 2022).

In terms of the sectoral policies in agriculture, livestock, and water, cutting across climate adaptation and mitigation, participants selected the National Agriculture Policy, National Livestock Policy, Agricultural Sector Transformation and Growth Strategy (ASTGS), Climate-Smart Agriculture Strategy (CSA Strategy), and Water Act (2016) as the most consequential sectoral frameworks for climate adaptation. This aligns with the literature recognizing agriculture and water as the most climate-sensitive sectors in Kenya, central to rural livelihoods and national economic stability (Thornton et al. 2018; FAO 2020). The workshop discussion reaffirmed the analytical finding that these policies are well aligned with Kenya's national climate strategies—yet suffer from uneven implementation and fragmentation.

One of the strongest insights emerging from the discussion concerned Kenya's agricultural extension system. Participants described widespread inconsistencies in extension messaging, inadequate technical capacity, and outdated curricula—issues long documented in agricultural innovation literature (Muyanga & Jayne 2020). According to participants, innovations often reach farmers in isolated, uncoordinated fragments, undermining adoption and reducing coherence across counties. This reinforces scientific evidence showing that climate-smart

agriculture is most effective when delivered as bundled innovation packages, including water management technologies, improved seeds, advisory services, and finance (Tesfaye et al. 2021; Snapp et al. 2022). The discussion therefore highlighted a fundamental implementation gap: while sectoral policies strongly support innovation scaling in principle, frontline delivery systems remain structurally weak.

Participants also emphasized the centrality of water governance, noting that the Water Act (2016) is critical for irrigation expansion, watershed management, and climate resilience. This aligns with literature showing that irrigation remains vastly underdeveloped despite significant potential for farmer-led irrigation development (World Bank 2020; Mwangi et al. 2021). The group argued that clearer co-implementation between the Ministry of Water and the State Department for Irrigation is necessary to translate water policy ambitions into scalable adaptation measures.

Regarding climate information services and early warning systems, representatives from the Kenya Meteorological Department highlighted significant challenges: Kenya's early warning ecosystem forecasts are often communicated in technical language, widely misinterpreted, and insufficiently integrated into county-level planning and farmer decision-making. These concerns directly parallel academic findings showing that climate information services in East Africa suffer from a persistent gap between scientific production and user interpretation (Hansen et al. 2019; Rao et al. 2015). Moreover, participants emphasized that political and financial support for early warning systems is inconsistent, leading to fragmented initiatives that lack continuity. Literature similarly identifies insufficient long-term financing as a major barrier to building adaptive capacity across arid and semi-arid regions (Jones & Boyd 2011; Ventura et al. 2021). The group stressed the need for user-friendly dissemination tools—SMS services, radio programs, mobile applications, and localized advisory networks—to ensure forecasts translate into timely protective action. In essence, the workshop reinforced the scholarly consensus that climate information systems must be embedded in participatory, locally adaptive communication channels to achieve impact.

The discussion on carbon markets revealed strong interest from farmers but significant concerns about exclusion, inequitable benefit sharing, and opaque project processes. Participants described the challenges facing smallholders, including high transaction costs, lack of knowledge, and limited institutional support, mirroring literature that warns of elite capture and inequitable distribution of carbon revenues in smallholder contexts (Atela et al. 2018; Röver et al. 2022). They noted that the 2024 Carbon Markets Regulations provide a promising foundation but require substantial awareness-raising and capacity-building efforts for farmers to participate meaningfully. Participants stressed the need for community-level agreements and trusted intermediaries—a finding consistent with studies showing that cooperative structures and social enterprises are essential for aggregation, verification, and transparent benefit sharing in carbon projects (Desanker et al. 2020). The discussion reflects a broader political economy insight: while carbon markets offer new mitigation and financing pathways, governance capacity and local institutional arrangements will determine whether these opportunities materialize equitably.

A recurring theme across the workshop was the misalignment between long-term climate strategies and short-term political incentives. Participants observed that political cycles, competing priorities, and shifting ministerial agendas often generate volatility in implementation—an issue widely documented in political economy literature on climate governance (Weiler et al. 2018; Harris & Bahadur 2021). They argued that stronger engagement with parliamentary committees, county assemblies, and political actors is necessary to secure sustained policy implementation. The group also highlighted widespread duplication of efforts among ministries, CGIAR centers, NGOs, and donors, reinforcing literature on Kenya's fragmented institutional landscape (World Bank 2023; Odongo et al. 2021). Participants argued that innovation ecosystems require far better coordination, shared learning, and standardized profiling of scalable innovations. Their proposal for a central innovation repository echoes global best practices in innovation systems, including knowledge observatories and open-access repositories that support decision-making and investment pipelines (Pigford et al. 2018; Douthwaite et al. 2019).

Participants underscored that innovation scaling is fundamentally constrained by limited financing and insufficient private-sector engagement. These concerns align with recent evidence showing that African agricultural and climate-smart innovations face high risks, limited credit access, and inadequate de-risking mechanisms (Carter et al. 2021; Kizito & Donovan 2022). The workshop highlighted the importance of blended finance, catalytic funds, and policy instruments that integrate private investment into climate adaptation strategies. Participants also pointed out tensions created by Kenya's import substitution policies, which at times undermine competitiveness and discourage private-sector participation. This observation echoes economic analyses cautioning against protectionist distortions in East African agricultural markets (Poulton et al. 2020). The need for a "balanced approach" to industrial policy—supportive of domestic production yet open to efficient value chain participation—was emphasized.

Finally, the workshop participants identified several strategic gaps, including limited youth and women's participation, insufficient community-level accountability mechanisms, and missing or weak frameworks in livestock, irrigation, and food safety. These gaps correspond with existing literature showing that gender and generational inequalities persist across climate adaptation programs (Carr & Thompson 2014; Ampaire et al. 2020). The discussion reinforced the need for clearer alignment between national climate frameworks and sector-specific policies, ensuring that innovation scaling efforts are coherent, demand-driven, and responsive to local contexts.

## 4. Discussions

The combined evidence from the policy inventory, literature review, and validation workshop reveals a climate policy ecosystem in Kenya that is extensive, technically sophisticated, and institutionally ambitious—but still marked by significant implementation asymmetries. Kenya's climate governance architecture, comprising 57 national, sectoral, devolved, and emerging instruments captured in the inventory, reflects over a decade of continuous institutional investment in climate adaptation and mitigation. The Climate Change Act (2016), National Adaptation Plan (2015–2030), successive National Climate Change Action Plans (NCCAPs), and updated Nationally Determined Contributions (NDCs) provide a coherent legal and strategic backbone that positions Kenya as a continental leader in climate governance. This framing was strongly echoed during the workshop, where participants consistently identified these instruments as the most authoritative and influential in shaping climate action.

Yet the discussions also highlighted the persistent gaps between policy formulation and operational delivery—gaps that are well-documented in the African climate governance literature. Workshop participants stressed that while Kenya's strategic frameworks align well with national development priorities and global commitments, their execution remains constrained by fragmented institutional mandates, inconsistencies in coordination across ministries, and limited implementation budgets. These concerns align with empirical research showing that climate policies across Sub-Saharan Africa often falter due to weak cross-agency coordination, insufficient resource flows, and capacity challenges at decentralized levels (Pauw & Klein 2015; Conway et al. 2019).

A major theme emerging from the workshop was the centrality of devolved climate governance as both an opportunity and a bottleneck. The inventory captured 11 devolved instruments, including County Climate Change Acts, County Climate Action Plans, County Climate Funds, and provisions for climate integration in County Integrated Development Plans (CIDPs). Participants affirmed that Kenya's devolved climate model is one of its strongest assets, enabling locally tailored adaptation, community participation, and integration of indigenous knowledge—findings supported by recent evaluations of Kenya's County Climate Change Funds (IIED 2022; Carter et al. 2022). However, participants also highlighted that sustainability of these instruments is jeopardized by unpredictable fiscal transfers, limited technical capacity in counties, and weak monitoring systems that constrain the ability to scale locally led innovations into nationally impactful pathways.

Participants further discussed the strategic importance of sectoral policies such as the Climate-Smart Agriculture Strategy, Agricultural Sector Transformation and Growth Strategy (ASTGS), National Livestock Policy, and the Water Act (2016). These frameworks were viewed as critical for embedding climate resilience within food, land, and water systems. However, concerns were raised about whether implementation mechanisms, particularly extension systems, M&E structures, and financing channels, are sufficiently robust to support widespread innovation uptake. This resonates with agricultural policy literature showing that scaling climate-smart innovations requires long-term institutional support, blended finance models, and strengthened last-mile service delivery systems (FAO 2022; Klerkx et al. 2019).

Another significant finding from the workshop concerns Kenya's emerging climate-industrial frameworks, including the Climate Change (Amendment) Bill (2023), the Carbon Markets Regulations (2024), the National Green Hydrogen Strategy (2023), and the National Cooling Action Plan (2022). Participants recognized these instruments as marking a shift toward new green economy frontiers but also emphasized that regulatory clarity, institutional readiness, and equitable benefit-sharing arrangements are still evolving. Literature similarly cautions that carbon markets, hydrogen strategies, and e-mobility transitions require strong institutional safeguards, robust MRV systems, and governance arrangements that prevent elite capture while ensuring community benefits (Schalatek & Watson 2020; Newell et al. 2021).

Overall, the synthesis of the inventory and workshop discussions demonstrates that Kenya has built a strong policy foundation capable of enabling climate innovation at scale. However, the enabling environment is uneven: while alignment and ambition are high, implementation remains constrained by structural governance challenges, insufficient financing predictability, and gaps in coordination and data systems. Strengthening these dimensions will be essential for moving from policy ambition to durable, equitable climate-resilient transformation.

## 5. Recommendations

The findings from the policy inventory, literature review, and validation workshop collectively point to several areas where targeted action could substantially strengthen Kenya's enabling environment for climate innovation scaling. Although Kenya's climate policy architecture is comprehensive and well-aligned with national development priorities, persistent implementation bottlenecks, particularly in coordination, financing, and institutional capacity, undermine the country's ability to translate policy ambition into durable, system-wide impact. Addressing these challenges requires reforms that reinforce coherence across the climate governance system, enhance institutional capacity at both national and county levels, and promote stronger linkages between public institutions, communities, private-sector actors, and research organizations.

A first priority is to strengthen cross-ministerial coordination and clarify institutional mandates, as workshop participants repeatedly emphasized that overlapping responsibilities between the Ministry of Environment,

Ministry of Agriculture, Ministry of Water, and devolved units create inconsistencies that slow implementation. Research similarly finds that fragmented institutional landscapes hinder climate policy delivery and innovation uptake across Sub-Saharan Africa (Conway et al. 2019; Pauw & Klein 2015). Establishing more formalized coordination mechanisms, harmonizing planning cycles across major national frameworks, and improving vertical alignment between national and county institutions would help consolidate existing processes, reduce duplication, and increase the efficiency of policy execution.

A second area requiring attention concerns the predictability and adequacy of financing for climate adaptation and mitigation. Many climate policies in Kenya remain underfunded, and counties, in particular, rely heavily on unpredictable national transfers or donor support. This limits their ability to operationalize County Climate Change Acts, Action Plans, and the County Climate Change Fund mechanisms that have proven effective where resources flow consistently (IIED 2022). Enhancing the operationalization of the national Climate Change Fund, improving transparency around disbursement criteria, scaling performance-based financing models such as the Financing Locally Led Climate Action (FLLoCA) program, and expanding blended finance mechanisms for climate-smart agriculture and green energy technologies would significantly strengthen implementation capacity across levels of government.

Equally important is the need to improve monitoring, evaluation, and learning systems. Both participants and the literature identify weak data systems, inconsistent reporting, and fragmented indicators as barriers to evidence-based decision-making. Harmonizing monitoring indicators across the National Climate Change Action Plan, the National Adaptation Plan, the Climate-Smart Agriculture Strategy, and county planning instruments, while strengthening partnerships with the Kenya Meteorological Department to support localized climate information services, would allow for more adaptive management and strengthen the alignment between climate priorities and resource allocation.

Another priority area concerns strengthening technical and institutional capacity at the county level. Counties are at the frontline of adaptation, yet workshop discussions revealed substantial gaps in climate finance management, planning, fiduciary oversight, and technical implementation. These findings mirror broader research showing that decentralized climate governance can only deliver transformative impact when supported by sustained investments in capacity development, extension services, and community-led planning systems (Carter et al. 2022). Targeted capacity strengthening initiatives, including technical backstopping, training in climate-budget integration, and improved support for county extension systems, would enable counties to more effectively implement climate priorities and facilitate the scaling of locally led innovations.

Finally, a reinforced partnership ecosystem between government, research institutions, and the private sector is essential to accelerate innovation scaling. Participants noted significant opportunities to leverage private-sector investment, especially in solar irrigation, cold chains, climate information services, and carbon markets, yet engagement remains limited by regulatory uncertainty and insufficient coordination. Developing structured mechanisms for public–private collaboration, strengthening investment pipelines aligned with key frameworks such as the Climate-Smart Agriculture Strategy and NCCAP, and promoting responsible private-sector participation in emerging markets such as carbon trading and green hydrogen could unlock additional resources and accelerate technology adoption at scale. Together, these recommendations emphasize that Kenya’s climate policy landscape offers a strong foundation, but its potential will only be realized through reforms that prioritize coherence, capacity, predictable financing, and collaborative partnerships. Strengthening these elements will enable Kenya to more effectively bridge the gap between policy ambition and implementation reality, positioning the country to advance climate-resilient and inclusive innovation scaling across food, land, and water systems.

For the S4I program specifically, the findings point to several additional strategic entry points. First, S4I can formalize a “responsible scaling” approach within Kenya’s climate innovation landscape, focusing on safeguards, equity, and anticipatory risk management, especially in areas such as carbon markets, digital agriculture, and green industrialization. Second, S4I can develop a Kenya Country Scaling Strategy that aligns its research, policy engagement, and investment brokering with the country’s priority frameworks (NCCAP, NAP, ASTGS, and FLLoCA), thereby ensuring that its contributions reinforce existing national systems rather than creating parallel structures. Third, S4I is uniquely positioned to serve as a neutral knowledge broker by establishing a national repository of scalable innovations, convening evidence-to-policy dialogues, and strengthening learning partnerships between counties, ministries, and private actors. Finally, S4I can support Kenya by designing country-specific scaling pathways for high-potential innovations, such as solar irrigation, climate information services, regenerative agriculture, and cold-chain solutions, integrating market, policy, and institutional dimensions to accelerate uptake responsibly and at scale.

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