Climate change, agriculture, food and nutrition security policies and frameworks in Kenya

Working Paper No. 330

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Maren Radeny
Catherine Mungai
Dorothy Amwata
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Contact:
CCAFS Program Management Unit, Wageningen University & Research, Lumen building, Droevendaalsesteeg 3a, 6708 PB Wageningen, the Netherlands. Email: ccafs@cgiar.org

Photos:

Abstract

This paper reviews the current state of policies and frameworks on climate change, agriculture, food, and nutrition security in Kenya. Integrating climate change in policies and frameworks on agriculture, food and nutrition security is important for providing and strengthening the enabling environment for building farmers resilience and adaptive capacity. Similarly, climate change policies and frameworks need to integrate agriculture, food and nutrition security. In addition, the paper reviews some of the regional, continental, and global frameworks on climate change, agriculture and food security of relevance to Kenya. The paper combines a review of relevant literature, policies and frameworks on climate change, agriculture, food and nutrition security with expert interviews. The review shows that most climate change policies and frameworks integrate agriculture, food and nutrition security, with the majority prioritizing agricultural productivity and food availability. Similarly, most of the agriculture, food and nutrition security policies and frameworks integrate climate change adaptation, with very limited focus on mitigation. Mitigation is often considered as an adaptation co-benefit, thus adaptation actions that have mitigation benefits are highly prioritized. In particular, the recent policies and frameworks are aligned with the regional, continental and global frameworks such as the Sustainable Development Goals (SDGs), the Comprehensive African Agriculture Development Programme (CAADP), and the Paris Agreement. The review also shows that a number of institutions in Kenya are working on climate change and agriculture, with institutional overlaps in some cases in focus areas of interventions. Strengthening institutional arrangements and coordination may help consolidate and promote partnerships among independent institutional efforts.

Keywords

Climate change; agriculture; food and nutrition security; policy integration; Kenya

About the authors

Maren Radeny is the Science Officer of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) East Africa. Email: m.radeny@cgiar.org

Catherine Mungai is the Country Project Officer – Biodiversity Engagement Facilitation, International Union for Conservation of Nature (IUCN). Prior to this, she was the Partnership and Policy Specialist of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) East Africa. Email: catherine.mungai@iucn.org

Dorothy A. Amwata is a Senior Lecturer, Department of Agricultural Sciences, South Eastern Kenya University and an Adjunct Faculty Member, Murang'a University of Technology. Email: damwata@seku.ac.ke

Joab Osumba is a Climate Smart Agriculture Policy Specialist of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) East Africa. Email: J.Osumba@cgiar.org

Dawit Solomon is the Regional Program Leader of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) East Africa. Email: d.solomon@cgiar.org

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Acronyms

ACCAP	African Development Bank Climate Change Action Plan
AFFAA	Agriculture, Fisheries and Food Authority Act
ARNS	Africa Regional Nutrition Strategy
ASCU	Agriculture Sector Co-ordination Unit
ASDP	Agriculture Sector Development Programme
ASDS	Agriculture Sector Development Strategy
ASTGS	Agriculture Sector Transformation and Growth Strategy
AUCSS	African Union Climate Change Strategy
AU-NEPAD	African Union-New Partnership for Africa's Development
CAADP	Comprehensive African Agriculture Development Programme
CCA	Climate Change Act
CCAP	Climate Change Action Plan
CRMA	Climate Risk Management and Adaptation Strategy
CSA	Climate-smart agriculture
EAC	East African Community
EAC-ARDP	East Africa Commission Agriculture and Rural Development Policy
EAC-CCP	East African Community Climate Change Policy
EAC-CCMP	East African Community Climate Change Master Plan
EAC-FNSP	East African Community Food and Nutrition Security Policy
EAC-FSAP	East African Community Food Security Action Plan
EACCS	East Africa Climate Change Strategy
EARNS	Africa Regional Nutrition Strategy
EMCA	Environmental Management and Coordination Act
ERSWEC	Economic Recovery Strategy for Wealth and Employment Creation

ESCR	Economic, Social and Cultural Rights
FAFS	Framework Pillar III on African Food Security
FAS	Framework for African Food Security
FMDA	Fisheries Management and Development Act
GCM	Global Circulation Model
GDP	Global Domestic Product
GESIP	Green Economy Strategy and Implementation Plan
GHG	Greenhouse gas
ICESCR	International Covenant on Economic, Social and Cultural Rights
IDDRSI	IGAD Drought Disaster Resilience and Sustainability Initiative
IGAD	Intergovernmental Authority on Development
KALRO	Kenya Agricultural Livestock Research Organisation
KAPAP	Kenya Agricultural Productivity and Agribusiness Project
KCSAIF	Kenya Climate-Smart Agriculture Implementation Framework
KCSAS	Kenya Climate Smart Agriculture Strategy
KJWA	Koronivia Joint Work on Agriculture
KRDS	Kenya Rural Development Strategy
KYAS	Kenya Youth in Agribusiness Strategy
MWA	Millennium Water Alliance
NAIPS	National Agriculture Investment Plans
NARSP	National Agricultural Research System Policy
NDC	Nationally Determined Contribution
NDHAC	Nairobi Declaration on the Horn of Africa Crisis
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action

NARSP	National Agricultural Research System Policy
NAS	National Agribusiness Strategy
NASEP	National Agricultural Sector Extension Policy
NCCAP	National Climate Change Action Plan
NCCFP	National Climate Change Framework Policy
NCCRS	Kenya National Climate Change Response Strategy
NFNSP	National Food and Nutrition Security Policy
NFNSPIF	National Food and Nutrition Security Policy Implementation Framework
NLP	National Land Policy
NLP	National Livestock Policy
NOFP	National Oceans and Fisheries Policy
NPCF	National Policy on Climate Finance
NSPP	National Social Protection Policy
NWMP	National Water Master Plan
SDG	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction
SPARS	Strategic Plan for Agricultural and Rural Statistics
UNFCCC	United Nations Framework Convention on Climate Change

Introduction

Agriculture is a fundamental part of Kenya's economy, directly contributing 25% of the total gross domestic product (GDP) and another 27% indirectly through linkages to other sectors such as manufacturing, distribution and services; and accounts for 65% of Kenya's export earnings (GoK 2017). As of 2017, the agriculture sector contributed 32% of GDP, provided about 75% of total employment in Kenya and supported livelihoods of more over 80% of the rural population—employment, income, and food security needs (GoK 2018). The sector is large and complex with diverse actors—public, non-governmental and private actors. Kenya's agriculture and environment are facing many challenges and threats that include ecosystem degradation, climate variability and change, use of unsustainable production methods, limited technical and financial resources; limited value addition and weak institutional coordination (GoK 2013a, GoK 2017), thus threatening agricultural production and productivity, and food and nutrition security.

Kenya's climate is changing. According to the General Circulation Models (GCMs), mean annual temperature is projected to increase by between 0.8 and 1.5°C by the 2030s and 1.6°C to 2.7°C by the 2060s (GoK 2015). Temperature increase has been observed across all seasons (between 1960–2013), but particularly from March to May (GoK 2018) and varies between locations. Similarly, rainfall patterns are changing though there is considerable model disagreement with a range of projections varying from a 5% decrease to a 17% increase by the 2030s, and no change to a 26% increase by 2060s. The rainfall seasonality (short and long rains) is likely to remain the same. However, the long rainy season has become shorter and drier, and the short rainy season has become longer and wetter, while overall annual rainfall remains low (GoK 2018). Droughts have become more frequent, prolonged and more intense. The projected changes in temperature and precipitation patterns are likely to have negative impacts on the climate-sensitive sectors of the economy such as agriculture, water and energy, among others. In addition, the increasing intensity and magnitude of extreme weather-related events aggravates conflicts, mostly over natural resources, and contributes to security threats.

For agriculture, climate variability and change, including frequent and severe extreme weather events pose additional risks and uncertainties to the country's agricultural production and have the potential to significantly affect agriculture-based livelihoods. The changes in temperature and rainfall patterns and extreme weather-related events are expected to affect crop and livestock production—lead to increased incidences and emergence of new pests, diseases and weeds, all of which could significantly increase agricultural yield losses—with negative impacts on food and nutrition security. It is estimated that over 10 million people in Kenya suffer from chronic food insecurity and poor nutrition, and between two and four million people require emergency food assistance at any given time with nearly 30% of Kenya's children classified as undernourished, with widespread micronutrient deficiencies (Kamenwa 2017).

Food and nutrition security exist when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and

healthy life (FAO 2008, World Food Summit 1996). Food security encompasses food availability (through production, storage or imports); access to food (through own-production or buying from the market), utilization and stability. To achieve nutrition security, food security should be combined with education, a sanitary environment, clean water, adequate health services and proper care and feeding practices to ensure a healthy life for all. Kenya's agricultural systems are mainly rainfed and highly vulnerable to climate variability and change, and underscoring the need to build resilience and adapt to these emerging challenges to meet the increasing demand for food for a growing population while increasing production of export crops and livestock to generate foreign exchange is critical. Agriculture is not only impacted by climate change, it also one of the main sources of greenhouse gas (GHG) emissions contributing to climate change, implying synergies between adaptation and mitigation strategies and actions are required. In Kenya, for example, agriculture is the largest source of GHG emissions, accounting for about 41% of total national GHG emissions (GoK 2015). Agriculture, therefore, is central to creating synergies on food and nutrition security, poverty reduction, adaptation and mitigation. Climate-smart agriculture (CSA) practices such as agroforestry have the potential to abate 4.2 MtCO2e by 2030 and could offer climate resilience benefits of improved soil quality and health, improved water retention in the soil and reduced erosion and land degradation.

Climate-informed policies and institutional frameworks governing agriculture, and food and nutrition security play a vital role in providing an enabling environment for building farmers' resilience and adaptive capacity within the context of a changing climate and for stimulating sustainable economic growth. This working paper reviews the current state of policies and frameworks on climate change, agriculture, food, and nutrition security in Kenya, including their level of integration. The review also examines some of the regional, continental, and global frameworks on climate change, agriculture and food security relevant to Kenya. Specific objectives include: i) Evaluating the extent to which climate change —adaptation and mitigation—are integrated into agriculture, food and nutrition security policies and frameworks; ii) Integration of agriculture, food and nutrition into climate change adaptation and mitigation policies and frameworks; iii) Identifying strengths and gaps of the policies and frameworks; and iv) Recognizing potential entry points for different actors including international, regional and national research organizations to strengthen their engagement at national and county levels to inform policy development and implementation for enhanced resilience in agriculture, and improved food and nutrition security.

Methods

The review used three complimentary approaches: i) Desk review of relevant publications, policies and frameworks on climate change, agriculture, food and nutrition security; ii) Stakeholder consultations with experts from relevant government ministries and agencies, and research organizations based on their engagement and contribution to the relevant policies and frameworks on climate change, agriculture, food and nutrition security; and iii) Relevance scoring of national and sector-specific policies, frameworks and programs regarding the extent to which they are designed to address climate change adaptation and mitigation actions, agriculture, food and nutrition security.

The desk review involved a comprehensive literature review and analysis of relevant national policy documents, frameworks, strategies, long and mid-term plans, including project documents, programs and projects prepared by the relevant ministries and various organizations related to climate change, agriculture, food and nutrition security and other relevant publications and reports. The desk review also focused on institutional arrangements, including regional, continental and global policies and conventions related to climate change, agriculture, and food and nutrition security that are relevant to Kenya. The expert consultations included actors and key informants representing relevant lead government agencies, research organizations and non-governmental institutions with the mandate to address climate change, agriculture, food, and nutrition security. About 17 leading national experts were interviewed on the basis of their engagement and contribution to policies and frameworks on climate change, agriculture, food and nutrition security. Details of the interviewed experts are provided in Annex 1.

The relevance scoring of the climate change policies and frameworks on the extent to which they integrate agriculture, food and nutrition security (agricultural productivity, food availability, food access and food nutrition); and the extent to which agriculture, food and nutrition security policies and frameworks integrate climate adaptation and mitigation was undertaken with five weighted groups (on a scale of 1-5) as summarized in Table 1. The relevance scores were established for the different components of climate change (adaptation and mitigation), agriculture (productivity), food and nutrition security (availability, access, and utilization). The weights were then aggregated to percentiles and grouped into three categories of relevance: High (≥75%), Medium (50-74%) and Low (< 49%).

Over 50 policies and frameworks on climate change, agriculture, food and nutrition security were reviewed across scales, including establishing the extent of their integration (Table 2).

Table 1. Scoring for policy relevance

Relevance	Description	Score
Very High	Climate change or agriculture, food and nutrition security are the primary objective	5
High	Climate change or agriculture, food and nutrition security are a significant, but not primary objective	4
Moderate	Climate change or agriculture, food and nutrition security objectives are not explicitly stated; but the activities promote climate change adaptation and mitigation actions or agriculture, food and nutrition security	3
Little	Climate change or agriculture, food and nutrition security are not the target objective, but the activities have indirect adaptation and mitigation or agriculture food and nutrition security benefits	2
Very Little	Climate change or agriculture, food and nutrition security are not the target objective at all, but the activities have minimal indirect links to climate actions or agriculture and food and nutrition security	1

Table 2. Summary of climate change, agriculture, food and nutrition security policies and frameworks reviewed

Policy and Framework	Global and Regional	National
Development and cross-cutting	• UN Agenda 2030 – Sustainable Development Goals (SDG) • International Covenant on Economic, Social and Cultural Rights (ICESCR) • IGAD Drought Disaster Resilience and Sustainability Initiative Strategy (IDDRSI, 2013) • Sendai Framework for Disaster Risk Reduction (SFDRR, 2015-2030) • Nairobi Declaration on the Horn of Africa Crisis (NDHAC, 2011) • AU Agenda 2063	• Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC, 2003-2007) • Kenya Vision 2030 (2008) • Green Economy Strategy and Implementation Plan (GESIP, 2016-2030) • Kenya Rural Development Strategy (KRDS, 2002-2017) • National Social Protection Policy (NSPP, 2015) • Big Four Agenda (2018-2022)
Climate	• United Nations Framework Convention on Climate Change (UNFCCC, 1992) • African Union Climate Change Strategy (AUCCS, 2016) • AfDB Climate Risk Management and Adaptation Strategy (CRMA, 2009) • African Development Bank Climate Change Action Plan (ACCAP, 2011-2015) • African Union Climate Change Strategy (AUCCS) 2015-2035 (A Comprehensive Framework for Climate Change Programs in Africa) • East African Community Climate Change Policy (EAC-CCP, 2011) • East African Community Climate Change Master Plan (EAC-CCMP, 2011-2031) • East Africa Climate Change Strategy (EACCS, 2015-2016)	• Kenya National Climate Change Response Strategy (NCCRS, 2010) • National Climate Change Action Plan (NCCAP, 2013-2017) • National Climate Change Action Plan (NCCAP, 2018-2022) • National Adaptation Plan (NAP, 2015-2030) • National Climate Change Framework Policy (NCCFP, 2016) • Climate Change Act (CCA, 2016) • Kenya's Nationally Determined Contribution (NDC 2015) • National Policy on Climate Finance (NPCF, 2018)
Agriculture[1]	• Maputo Declaration Comprehensive African Agriculture Development Programme (CAADP 2003)	• Agriculture Sector Development Strategy (ASDS, 2010-2020) • Kenya Climate-Smart Agriculture Strategy (KCSAS, 2017-

[1] Agriculture includes crops, livestock and fisheries.

Policy and Framework	Global and Regional	National
	• CAADP Framework Pillar III on African Food Security (FAFS) • Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods (Malabo Declaration, 2014) • East Africa Commission Agriculture and Rural Development Policy (EAC-ARDP, 2006)	2026) • The Agriculture Sector Transformation and Growth Strategy (ASTGS, 2019–2029) • Kenya Climate-Smart Agriculture Implementation Framework (KCSAIF, 2018–2027) • National Agricultural Research System Policy (NARSP, 2012) • Strategic Plan for Agricultural and Rural Statistics (SPARS, 2015-2022) • National Agricultural Sector Extension Policy (NASEP, 2012) • Agriculture, Fisheries and Food Authority Act (AFFAA, 2013) • National Livestock Policy (NLP, 2015) • National Oceans and Fisheries Policy (NOFP, 2008) • National Agribusiness Strategy (NAS, 2012) • Kenya Youth in Agribusiness Strategy (KYAS, 2017-2021) • Fisheries Management and Development Act (FMDA, 2016)
Food and Nutrition Security	• Africa Regional Nutrition Strategy (EARNS, 2015-2025) • EAC Food and Nutrition Security Policy (EAC-FNSP, 2014) • EAC Food Security Action Plan (EAC-FSAP, 2011–2015)	• National Food and Nutrition Security Policy (NFNSP, 2011) • National Food and Nutrition Security Policy Implementation Framework (NFNSPIF, 2017-2022)
Land, Environment and Water		• Environmental Management and Coordination Act (EMCA, Revised Edition 2012, Amended 2015) • National Water Master Plan (NWMP, 2030) • National Land Policy (NLP, Sessional Paper No. 3 of 2009)

Global and regional frameworks relevant to climate change, agriculture, food and nutrition security

This chapter reviews some of the overarching frameworks relevant to climate change, agriculture, food, and nutrition security. These include the International Covenant on Economic, Social and Cultural Rights (ICESCR, 1972), the Sendai Framework for Disaster Risk Reduction (SFDRR, 2015-2030), the IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI) Strategy (2013), the Nairobi Declaration on the Horn of Africa Crisis (2010), and the Sustainable Development Goals (SDGs).

International Covenant on Economic, Social and Cultural Rights (ICESCR, 1972)

The ICESCR is a multilateral treaty ratified by Kenya in 1972 and commits parties to work towards granting of economic, social, and cultural rights (ESCR) to the Non-Self-Governing and Trust Territories and individuals. Article 11 of the treaty recognizes the right of everyone to an adequate standard of living, food (and water), clothing, housing, and the continuous improvement of living conditions. In addition, it creates an obligation on parties to work together to eliminate world hunger. The right to adequate food refers to the availability of food in a quantity and quality enough to satisfy the dietary needs of individuals, free from adverse substances, and acceptable within a given culture. The framework integrates agriculture, food and nutrition security. However, the framework does not integrate climate change, given this was before Kenya ratified the United Nations Framework Convention on Climate Change (UNFCCC) and as a party submitted its national communications that recognized the interrelations between climate change and agriculture and food security. The document needs to be updated to reflect the current and emerging challenges from climate variability and change.

Sendai Framework for Disaster Risk Reduction (SFDRR, 2015-2030)

Adopted in 2015 at the Third UN World Conference on Disaster Risk Reduction, the SFDRR aims to achieve a substantial reduction of disaster risk and losses of lives, livelihoods and health, and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. The framework advocates for the integration of disaster risk reduction and resilience-building into policies, plans, programs and budgets at all levels with a focus on four priority areas: understanding disaster risk, strengthening disaster risk governance, investing in disaster reduction for resilience, and enhancing disaster preparedness for effective response and recovery, rehabilitation and reconstruction in all vulnerable sectors including agriculture, food and nutrition security. It recognizes climate variability and change as among the drivers of disaster risks, many of which are increasing in frequency and intensity and significantly reducing progress towards achieving sustainable development.

IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI) Strategy (2013)

The strategy aims to address the effects of drought and related shocks in the Intergovernmental Authority on Development (IGAD) region in a sustainable and holistic manner, following the severe drought that devastated the region in 2010/2011. The strategy serves as a common framework for developing and designing national and regional programs to enhance drought resilience through

building sustainability in the region. In addition, the strategy recognizes the need for a comprehensive and holistic approach to addressing chronic food and nutrition insecurity. Kenya contributes to IDDRSI through ending drought emergencies specifically by ensuring equitable access and sustainable use of natural resources for improved environmental management; providing equitable access to livelihood support and basic social services; and improving disaster risk management capabilities and preparedness for effective response; enhancing the generation and use of research, knowledge, technology and innovations in the region (IGAD 2013). While the strategy addresses climate change adaptation, it does not incorporate adaptation co-benefits (mitigation).

Nairobi Declaration on the Horn of Africa Crisis (NDHAC, 2011)

Kenya is collaborating with leaders from the Horn of Africa to end recurring humanitarian crises. In September 2011, the country's president hosted heads of states representing IGAD and East African Community (EAC) member countries who adapted the Nairobi Action Plan which aims to eradicate drought emergencies in the Horn of Africa. The NDHAC action areas include: acceleration of economic recovery and development - especially enhancing reconciliation and social cohesion; and significant and sustained response to drought situations to alleviate and contain the humanitarian impact, facilitation of free movement of persons and livestock and strengthening of cross border cooperation and borderland development in the region. The declaration focuses on addressing the food security crisis with no mention of climate change.

Agenda 2030 – Sustainable Development Goals (SDG)

The SDG dedicated to climate change is SDG 13 on Climate Action which focuses on taking urgent action to combat climate change and its impacts. Targets under this goal include strengthening resilience and adaptive capacity to climate-related risks, and inculcates the work covered by the different institutions on climate extreme events and early warning; improving human and institutional capacity on climate change adaptation, mitigation, impact reduction and early warning; integrating climate change in national policies, strategies and planning; implementing developed-country commitments under UNFCCC with the aim of jointly mobilizing resources to address the needs of developing countries; and promoting mechanisms for raising capacity for effective climate change-related planning and management in least developed countries. SDG 2 is dedicated to ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture. SDG 2 targets include by 2030, ending hunger and ensuring all people have access to safe, nutritious and sufficient food all year round; ending all forms of malnutrition; doubling the agricultural productivity and incomes of small-scale food producers; ensuring sustainable food production systems and implementing resilient agricultural practices that increase productivity and production. Other targets include by 2020, maintain the genetic diversity of seeds, cultivated plants and domesticated animals, including their related wild species and ensure access by all people; increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks; correct and prevent trade restrictions and distortions in world agricultural markets; adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves. Other SDGs

with climate change elements include zero poverty (SDG 1), gender equity (SDG 5), sustainable consumption and production (SDG 12), life below water (SDG 14), and life on land (SDG 15).

AU Agenda 2063

African Union's Agenda 2063— "The Africa We Want"— is Africa's 50-year strategic framework for transforming the continent into a global powerhouse for inclusive growth and sustainable development. Agenda 2063 was adopted in 2015 and is anchored on the AU vision, with seven aspirations. The aspirations include a prosperous Africa based on inclusive growth and sustainable development; an integrated and politically united continent; good governance, respect for human rights, justice and the rule of law; peace and security; strong cultural identity, common heritage, values and ethics; people-driven development; and a strong, united, resilient and influential global player and partner. Agenda 2063 builds on and seeks to accelerate the implementation of existing continental frameworks. For agriculture, these include the New Partnership for Africa's Development (NEPAD), the Comprehensive Africa Agriculture Development Programme–CAADP, the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods (3AGTs), and Africa's Agro-industry and Agribusiness Development Initiative (3ADI). Within the Agenda 2063 Strategic Framework, several continental frameworks have been developed to address the development of key sectors such as agriculture, trade, transport, energy and mining. These sectors are key in enabling AU Member States to achieve their development goals.

Climate change, agriculture and food security are extensively covered under Aspiration 1 on a prosperous Africa based on inclusive growth and sustainable development. Priority areas for agriculture include modernizing the sector for increased production, productivity and value addition anchored in scientific knowledge, and building resilient food and agricultural systems and self-financing agricultural development. Additional priorities include, increased intra-African trade in food and agriculture through broader and deeper continental market integration facilitated by the establishment of adequate market and trade infrastructure to connect farmers to local, national and regional markets through a dynamic network of efficient value chains of strategic food and agricultural commodities. Priority areas of relevance to climate change include promoting environmentally sustainable and climate resilient economies and communities by prioritizing sustainable natural resource management and biodiversity conservation with a focus on climate resilient low carbon production systems to reduce vulnerability to climate risk and related natural disasters; sustainable consumption and production patterns; water security; climate resilience and natural disasters preparedness and prevention; and renewable energy. Other priority areas include health and nutrition, reduction in poverty, inequality and hunger, and management of marine resources and energy.

Global and regional frameworks on climate change

Climate change calls for collective global and regional response and cooperation by all countries. To this effect, several international and regional frameworks have been established to ensure collective response and cooperation. This section looks at the global and regional frameworks on climate change that are relevant to Kenya, and the extent to which they integrate agriculture, food and nutrition security.

United Nations Convention Framework on Climate Change (UNFCCC, 1992)

The 1992 UNFCCC provides the foundation for multilateral action to combat climate change and its impacts on humanity and ecosystems. The objective of the UNFCCC is to stabilize GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Given that climate change is inherently global in nature, there is motivation and need for collective global action under the UNFCCC that calls for decision making at many levels: international – through intergovernmental organizations (IGOs) and various processes at regional, national, sub-national, and local levels – including by local governments, individuals, communities, multinational firms and local enterprises. Since 1995, parties to the convention meet annually in Conferences of the Parties (COP) to assess progress in dealing with climate change. Kenya ratified the UNFCCC in 1994, and as a party to the UNFCCC, has submitted first and second national communications (GoK 2002, 2015) which recognized the interrelations between climate change and agriculture in terms of influencing employment, food security, livelihoods and economic development. Climate change has the potential to significantly affect agriculture-based livelihoods by challenging the sustainability of the current arable, pastoral, and fishing practices. In addition, the reports show that agriculture contributes significantly to GHG emissions in Kenya, accounting for about 41% of Kenya's total national GHG emissions and is likely to increase from 30 $MtCO_2e$ in 2010 to 35 $MtCO_2e$ by 2030, largely driven by livestock methane emissions and land use and land cover changes (GoK 2015).

Despite the clear interactions between agriculture and climate change, agriculture did not feature prominently in the UNFCCC negotiations until COP23 which was held in 2017 in Bonn, Germany when parties made a landmark decision to establish the Koronivia Joint Work on Agriculture (KJWA). The decision recognizes agriculture's vital role in building resilient and sustainable futures for every human being while preserving natural ecosystems, and broadens the conversation on agriculture from its former scientific and technical focus to a more implementation-oriented approach. The six elements specifically mentioned in the KJWA decision cover many of the most promising areas for action, including soil, livestock, nutrient and water management, as well as assessment of adaptation, socio-economic and food security dimensions (UNFCCC 2018). The KJWA is viewed as an opportunity to promote the development and transfer of knowledge, best practices and technologies with the aim to address and face the major challenges posed by climate change to agriculture and food security (FAO 2018).

African Union Climate Change Strategy (AUCCS, 2016)

The AUCCS recognizes Africa's vulnerability to climate variability and change, a situation that is aggravated by the interaction of 'multiple stresses', including high dependence on rain-fed agriculture, widespread poverty and weak adaptive capacity. The negative impacts of climate change on human health, natural ecosystems, and other environmental, social, and economic impacts pose a challenge to Africa's socio-economic development. The strategy seeks to enhance the adaptive capacities and resilience of Member States and Regional Economic Communities (RECs) with a view to minimizing their vulnerability, pursuing a low carbon growth path dictated by principles of the green economy, sustainable development, and poverty reduction; and orienting governance, knowledge systems, planning, and national, regional and international structures to treat climate change as a development imperative. The strategy is organized around four pillars: i) Climate change governance; ii) Promotion of research, education, awareness raising and advocacy; iii) Mainstreaming and integrating climate change in planning, budgeting, and development processes; and iv) Promotion of national, regional, and international cooperation. The effectiveness of climate adaptation and mitigation, including clean technology development in Africa is highly dependent on a sound political structure that is keen on poverty alleviation and sustainable development. In its section XI, in Action 1 to 9, the AUCCS recognizes the importance of agriculture and food security and emphasizes the need to integrate risk management into national development plans, food security infrastructure, and contingency plans. The strategy also highlights the links between integrated management of water, energy, and food security, including use of adaptation funds to improve food security through ecologically sustainable and climate resilient improvements in agricultural production. While food security is well integrated into the strategy, issues of nutrition security are not explicitly integrated into the strategy.

The African Development Bank's Climate Risk Management and Adaptation Strategy (CRMA, 2009)

The overall goal of the CRMA is to ensure progress towards eradication of poverty and contribute to sustainable improvement in people's livelihoods, taking into account climate risk management and adaptation. The strategy is structured around two objectives: i) reducing vulnerability within the Regional Member Countries (RMCs) to promote climate resilience in the Bank's financed investments for effectiveness; and ii) building capacity and knowledge within the RMCs on climate change and ensure sustainability through policy and regulatory reforms. The strategy focuses on three main areas of intervention: i) climate-proofing investments - focuses on actions to ensure that development efforts are protected from negative impacts of climate change, climate variability, and extreme weather events and to ensure that climate-friendly development strategies are pursued; ii) policy, legal and regulatory reforms– focuses on supporting the development of policies that can address additional climate change related risks as well as strengthening the legal and regulatory reforms to create an enabling environment for the implementation of climate risk management and adaptation; iii) knowledge generation and capacity building – focuses on the use of available global financial resources as well as its own investment windows to address the specific CRMA related activities in its operations, as appropriate. This CRMA pays limited attention to agriculture, food and nutrition security.

African Development Bank Climate Change Action Plan (ACCAP, 2011–2015)

The ACCAP is designed to support RMCs to adapt to and to mitigate climate change while supporting the Bank's focus on infrastructure development and regional operations. The action plan is organized around three pillars—low carbon development, climate resilient development and a funding platform—to help African countries strengthen their capacity to respond to climate change and to mobilize resources from climate finance, private sector and market mechanisms. In addition, the plan includes advisory services, support to policy reform, knowledge generation and competency building that cut across all programs. The ACCAP takes into account the Bank's long-term strategy on green growth with respect to infrastructure and climate. On agriculture, food and nutrition security, it supports farmers through innovative CSA practices and access to inputs for increased agricultural productivity.

Comprehensive Framework for Climate Change Programs in Africa (AUSCC, 2015-2035)

Developed under the auspice of the African Ministerial Conference on Environment (AMCEN), the AUSCC was adopted in 2010 by all African countries to guide their operations on climate change. It highlights priority adaptation and mitigation options in key economic sectors for each country, including agriculture, food, and nutrition security. The key adaptation interventions relevant to agriculture include drought tolerant crop varieties and breeds, soil and water conservation, and diversification of livelihoods. For mitigation, the National Appropriate Mitigation Actions (NAMA) in the agriculture sector were prioritized for implementation (AMCEN 2010).

East African Community Climate Change Policy (EAC-CCP, 2011)

The policy guides East Africa partner states—Burundi, Kenya, Rwanda, Uganda and Tanzania—and other stakeholders on the preparation and implementation of collective measures to address climate change in East Africa, while assuring sustainable social and economic development. The policy guides interventions on climate change adaptation and mitigation to reduce the vulnerability of East Africa, enhance adaptive capacity and build socioeconomic resilience of vulnerable populations and ecosystems, with a focus on three pillars: adaptation, mitigation, and climate change research. Adaptation to climate change is of priority to the EAC region in view of the high vulnerability of the region to the impacts of climate change, with the emerging associated challenges, especially food security. On adaptation, the policy aims at implementing urgent and immediate adaptation priorities identified in the National Adaptation Programmes of Action (NAPAs), National Adaptation Plans (NAPs) and climate change strategies. Adaptation priorities include strengthening meteorological services and improving early warning systems; disaster risk management through risk reduction, preparedness, mitigation and reconstruction; scaling up of efficient use of water and energy resources; irrigation; crop and livestock production; strengthening pre- and post-agricultural losses; protection of wildlife and key fragile ecosystems such as wetlands, coastal, marine and forestry ecosystems; improving land use, soil protection, tourism; climate proofing social infrastructure, and reducing climate sensitive vector and water borne diseases. On mitigation, while the EAC region has negligible contribution to global GHG emissions, it is important for the region to contribute to the reduction of GHG emissions through

NAMAs for sectors with potentially high emission factors—energy, transport, agriculture, waste management and industry.

East African Community Climate Change Master Plan (EAC-CCMP, 2011–2031)

The plan provides a long-term vision to operationalize a comprehensive framework for climate change adaptation and mitigation through strengthening regional cooperation to address climate change impacts on shared resources such as wildlife and water ecosystems. The EAC-CCMP's vision is to ensure that: "The people, the economies and the ecosystems of the EAC partner states are climate resilient and adapt accordingly to climate change." It is aligned and consistent with EAC's mandate and development priorities as articulated in a number of relevant environmental and climate change documents such as the EAC climate change policy, EAC climate change strategy, EAC protocol on environment and natural resources management and EAC food security action plan. The overall objective of the EAC-CCMP is to strengthen regional cooperation to address climate change issues that concern regionally shared resources. The main regional issues which have been identified and prioritized by the EAC partner states as being vulnerable to climate change are: i) Agriculture (crops, livestock and fisheries) and food security; ii) Water security; iii) Energy security; iv) Ecosystems services and biodiversity; v) Tourism; vi) Infrastructure; vii) Human health, sanitation and settlements; viii) Trade and industry; ix) Education, science and technology. Under agriculture, for example, the master plan emphasizes on ensuring that the people, economies and ecosystems of the EAC partner states are climate resilient with agriculture and food security prioritized. Other areas include enhancing agricultural production and ensuring food security under a changing climate, adaptation and mitigation.

To ensure that the above sectors are climate-proofed, the EAC-CCMP has established eight key pillars: adaptation interventions; mitigation interventions; technology development and transfer; capacity building; education, training and public awareness; gender, youth and marginalized groups; climate risk management and disaster risk reduction and climate finance (EAC 2011a).

East Africa Climate Change Strategy (EAC-CCS, 2015–16)

The strategy sets out a range of measures, taking into account those already in place in the partner states, to ensure effective implementation of the EAC=CCP at all levels. The EAC-CCS gives the direction and scope of implementation of the policy in the short-term, defining all the necessary actions and resources needed in order to achieve its goal. In terms of adaptation, the strategy emphasizes increasing resilience to the adverse impacts of climate change and contributes to the achievement of SDGs in the EAC region through: i) Improving climate change adaptation technical capacity, policy leadership and action readiness of regional institutions; ii) Strengthening resilient and sustainable management of biologically significant transboundary freshwater ecosystems in the EAC region; and iii) Enhancing resilient and sustainable drinking water supply, sanitation, and wastewater treatment services in the Lake Victoria Basin. With regards to mitigation, it supports partner states in reviewing and updating their NDCs in line with the Paris Agreement.

Integration of agriculture, food and nutrition security in regional policies and frameworks on climate change

Several regional policies and frameworks on climate change have been discussed in the previous section that are applicable to the EAC member states, including Kenya. To what extent do these policies and frameworks integrate agriculture, food, and nutrition security? Table 3 summarizes the findings in relation to agriculture (agricultural productivity), food and nutrition security (availability, access, and utilization). With an average score of >85% (4.3), the results clearly show that agricultural productivity was the most integrated followed by food availability, food access and food utilization in that order.

Table 3. Integration of agriculture, food and nutrition security in regional policies and frameworks on climate change

Regional policies and frameworks on climate change	Agriculture	Food and nutrition security			Weighted average scores (%)
	Productivity	Availability	Access	Utilization	
IGAD Drought Disaster Resilience and Sustainability Initiative Strategy	4.1	4.5	3.2	3.6	77
Nairobi Declaration on the Horn of Africa Crisis	4.5	4.1	3.5	3.1	76
AfDB Climate Risk Management and Adaptation Strategy	3.9	4.6	4.2	3.6	82
African Development Climate Change Action Plan	4.7	4.0	3.9	3.9	83
Comprehensive Framework for Climate Change Programmes in Africa	4.2	2.8	1.7	2.2	55
African Union Climate Change Strategy	4.8	4.4	3.1	2.2	73
East Africa Climate Change Strategy	4.4	3.4	3.5	2.1	67
EAC Climate Change Master Plan	4.1	3.7	2.9	2.3	65
EAC Climate Change Policy	4.2	3.8	3.1	2.3	67
Average	**4.3**	**3.9**	**3.2**	**2.9**	**72**

Regional policies and frameworks on agriculture, food and nutrition security

In this section, we discuss the continental and regional policies and frameworks on agriculture, food and nutrition security of relevance to Kenya, including the extent to which they integrate climate change adaptation and mitigation.

Comprehensive African Agriculture Development Programme (CAADP, 2003)

The CAADP is coordinated by NEPAD—an implementing agency of the Africa Union Commission (AUC). CAADP is a strategic framework to guide member state development efforts and partnerships in the agricultural sector, focusing on improving food and nutrition security, and increasing incomes in Africa's largely agriculture-based economies by raising productivity and increasing public investment in agriculture. It aims to stimulate and facilitate agricultural transformation through increased productivity and performance, improvements in policy and institutional environments, access to improved technologies and information, and increased investment financing. Through CAADP, African Governments committed to increase public investment in agriculture to 10% of their annual national budgets and to raise and maintain agricultural productivity and annual growth by at least 6%. To achieve this goal, CAADP aims to stimulate agriculture-led development that eliminates hunger and reduces poverty and food insecurity (NEPAD 2009). CAADP focuses on accelerating agricultural growth and transformation, targeting increased agriculture production and productivity, expanded local agro-industry and value chain development inclusive of women and youth, increased resilience of livelihoods, improved management of risks in the agricultural sector and improved management of natural resources for sustainable agriculture. CAADP is organized around four interlinked pillars: i) Sustainable land and water management; ii) Rural infrastructure and trade-related capacities for market access; iii) Food security; and iv) Agricultural research, technology dissemination and adoption.

While CAADP is continental in scope, implementation is at the national level - formalized through a CAADP Compact agreement signed by all key partners. About 47 African countries have signed CAADP Compact to allocate 10% of their national budgets to agriculture, with 39 countries are formulating national agriculture and food security investment plans. Implementation of CAADP at the national level entails various complementary roles of different players - government, development partners, private sector, NGOs, community-based organizations, research institutions, producers and civil society. In addition, NEPAD established a climate fund in 2014 to provide technical and financial assistance to the African Union (AU) member states, RECs and institutions to implement projects targeting adaptation of agriculture to climate change. In Kenya, the ASTGS (2019-2029) seeks to transform the agricultural sector that sustainably supports Kenya's economic development in the context of devolution, national aspirations for 100% food security, and longer-term continental and global commitments to the Malabo Declaration under CAADP and SDGs (GoK 2019). With regards to agricultural investment and growth, Kenya's government agricultural expenditure growth rate increased significantly during the 2010-2014 period to 5.6%, with about 2.6% of the national budget allocated to agriculture in 2016—significantly below the 10% CAADP agricultural spending target. Similarly, Kenya's agricultural growth rate also

remained below the CAADP target of 6% per year, growing by 4.8% annually since 2012 (GoK 2019, Benin et al. 2016).

CAADP has initiated different projects and programs on mainstreaming climate change in agriculture including national agriculture investment plans (NAIPs), which ensures that climate change is integrated in the member state agriculture investment plans, including Kenya. CAADP-XP4 Program which is being implemented in seven countries[2], for example, intends to boost the agricultural transformation agenda through innovations in agriculture and food systems in partner countries which is expected to make them resilient to climate change and to better respond to the development demands. The main goal of CAADP-XP4 is to contribute towards the achievement of SDGs: on zero hunger (SDG 2), action to combat climate change and its impacts (SDG 13), promote progress towards ending poverty (SDG 1), gender equality (SDG 5), decent work and economic growth (SDG8), and responsible consumption and production (SDG 12). The five-year program (2019 to 2024) is valued at 30 million US dollars and aims to deploy technology and innovation to achieve an inclusive, sustainable and climate-smart transformation of the agricultural sectors amongst partner countries.

CAADP Framework Pillar III on African Food Security (FAFS)

CAADP Pillar III focuses on food security—increasing food supply, reducing hunger, and improving responses to food emergency crises. FAFS is the framework for the implementation of activities under CAADP Pillar III and sets out Pillar III's vision to increase resilience by decreasing food insecurity and linking vulnerable people to opportunities for agricultural growth through its relationship to the overall CAADP agenda and suggests specific actions at the regional and country level. It is a deliberate attempt to ensure that the agricultural growth agenda targets the chronically poor and vulnerable directly, and focuses on the chronically food-insecure and on populations that are vulnerable to and affected by various crises and emergencies to ensure that the CAADP plan simultaneously achieves the agricultural growth agenda and the broader African development goals of addressing poverty and hunger. Pillar III recognizes the need to reduce the vulnerability of poor households to economic and climatic shocks due to repeated exposure to shocks, erosion of household assets and coping mechanisms, and deepening poverty. Pillar III highlights the linkages between poverty, hunger, and malnutrition—and the enormous threat posed by chronic hunger and malnutrition to the current and future productivity of Africa. FAFS highlights four food security challenges: i) Inadequate risk management at all levels from household to regional levels, ii) Inadequate food supply and marketing systems for distributing food, iii) Lack of income opportunities for the vulnerable, and iv) Hunger and malnutrition. FAFS aims to provide principles, recommended actions, coordination, peer review and tools to guide national and regional policies, strategies, investments, partner contributions and advocacy efforts to overcome these challenges, leading to increased food supply, reduced hunger and malnutrition, and improved food security risk management. FAFS recognizes four key objectives that contribute to increasing resilience in

[2] Eswatini, Namibia, Botswana, Mozambique, Tanzania, Zambia and Zimbabwe

vulnerable populations, and identifies the immediate, medium- and long-term priorities and options for each of the objectives:

- Improved risk management across scales (from household to regional levels) to inform decisions for building and protecting assets and investments, and strengthening responses to climatic and economic shocks that risk and undermine the coping mechanisms of vulnerable populations;
- Increased supply of affordable commodities through increased production and improved market linkages to increase the food available to households and communities including new technologies, better application and delivery of existing technologies, and improved farm incentives;
- Increased economic opportunities for the vulnerable through identifying potential opportunities for diversification of livelihoods—particularly in support of adding value to agricultural production (through local processing, handling, transport, etc.) to build resilience and contribute to rural growth; and
- Increased quality of diets through diversification of food among the target groups, for example, increasing the ability of the poor to access sufficient protein and micronutrients through varied, nutritious diets in order to ensure sustainable gains in the battle against poverty, hunger and malnutrition.

Malabo Declaration (2014)

The Malabo Summit is a critical policy initiative for African economic growth and poverty reduction that reaffirmed the importance of agriculture on Africa's development agenda. The Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods outlines a number of commitments that include: i) Recommitment to the principles and values of the CAADP process, ii) Enhance public and private investment finance to agriculture, iii) Reduce poverty by half through agricultural transformation and growth, and iv) Boost intra-Africa trade in agricultural commodities and services. Of particular relevance to climate change is the commitment to enhancing the resilience of livelihoods and production systems to climate variability and related risks by ensuring that by 2025 at least 30% of the farmers, pastoralists and fishing households are resilient to climate and weather related risks, enhancing investments for resilience building initiatives - including social security and mainstreaming resilience building and risk management in policies, strategies and investment plans. With regards to food and nutrition security, the Malabo Declaration commits to ending hunger in Africa by 2025 through accelerated agricultural growth, reducing post-harvest losses, integrating measures for increased agricultural productivity with social protection initiatives focusing on vulnerable social groups, and improving nutritional status particularly for children. Other commitments include mutual accountability to actions and results through a regular review process of progress made in implementation and strengthening the AUC to support delivery of these commitments.

EAC Agriculture and Rural Development Policy (EAC-ARDP, 2006)

Agriculture and food security are key areas of cooperation among the EAC Partner States as outlined in Chapter 18 of the EAC Treaty (EAC 1999). The cooperation in agriculture and rural development aims to achieve food security and rational agricultural production. The specific objectives include: i) Achieving food security and improving the standards of nutrition by increasing output, quality and availability of food; ii) Encouraging rational agricultural production through complementarities and specialization; iii) Improving standards of living in rural areas through increased income generation from agricultural production, processing and marketing; iv) Increasing foreign exchange earnings through production and export of agricultural and fisheries products; v) Supporting industrialization; vi) Encouraging the development of new and appropriate technologies that improve land and labor productivity; and vii) Promoting sustainable use and management of natural resources.

The EAC-ARDP serves as an initial step in implementing one of the key objectives of the EAC Treaty—to ensure sustainable agricultural development and foster economic growth in the community and aim to enhance cooperation in agriculture and rural development. EAC-ARDP guides the development of strategies, programs and projects for realization of the above objectives. The focus areas of the policy include:

- ***Attaining food security:*** Through increased agricultural production, processing, storage and marketing,
- ***Crop production*****:** Improve and intensify crop production in the region to meet local and export requirements for food and raw materials,
- ***Animal production*****:** Produce enough quality animals and animal products to match both the requirement of the rapidly increasing human population in the region and for the export market,
- ***Fisheries*****:** Promote conservation, development and sustainable management, increased production and utilization of fisheries resources,
- ***Forestry*****:** Promote sustainable management, development and utilization of forest resources for environmental and socio-economic benefits,
- ***Research, training and extension*****:** Enhance agricultural production and productivity through effective research-extension-training-farmer linkages,
- ***Plant and animal pests and diseases*****:** Reduce the impact of pests and diseases for plants and animals in order to promote sustainable production and trade,
- ***Irrigation and water management*****:** Increase agricultural production and productivity and stimulate crop diversification (for high value and high-quality products for domestic and export markets) and production of forages,
- ***Natural disasters*****:** Increase agricultural production and productivity in disaster prone areas, mitigate the effect of natural disasters, and combat the threat of desertification,

- ***Processing and marketing*:** Improve access of agricultural products to both domestic and international markets, and
- ***Financing agriculture and agro-processing*:** Secure financial resources that will be invested or lent to the sector to ensure competitive agricultural production and development.

Other cross cutting areas include gender integration, sustainable land and environment management, and an enabling legal and regulatory framework for agricultural and rural development. While the EAC-ARDP comprehensively addresses agriculture, food and nutrition security, there is no emphasis on climate change adaptation and mitigation.

EAC Agriculture and Rural Development Strategy (EAC-ARDS, 2005–2030)

As stated in the EAC-ARDP, the overall objective of cooperation in agriculture and rural development as set out in the EAC Treaty is the achievement of food security and rational agricultural production. The East African Agriculture and Rural Development Strategy (EAC-ARDS) recognizes that the rural economy is the backbone of development efforts in the region including Kenya, with 80% of the population living in rural areas with 75% of them engaged in agriculture. Agriculture contributes substantially to foreign exchange earnings and employment. The overall vison of the strategy is to achieve a well-developed agricultural sector for sustainable and equitable economic growth and development. The strategy seeks to support, promote and facilitate the development, production and marketing of agricultural produce and products to ensure food security, poverty reduction and sustainable economic development in Kenya and other EAC countries.

EAC-ARDS proposes several actions and interventions to facilitate rural development guided by EAC-ARDP. Of specific relevance to this review and Kenya are interventions focusing on: i) Improving food security; ii) Accelerating irrigation development; and iii) Strengthening early warning systems. Other areas of intervention include strengthening research; extension and training; increasing intra- and inter-regional trade and commerce; promoting improvement of physical infrastructure and utilities; improving governance, legal and regulatory frameworks; promoting agro-based industries development and value addition; promoting emerging industries; sustainable utilization of natural resources; improving access to productive resources including credit, land, inputs; control of animal and crop pests and diseases; financing agriculture and agro-processing; and mainstreaming crosscutting issues such as gender. Programs under the strategy will be implemented at the EAC and partner states levels such as Kenya, in partnership with a broad range of relevant stakeholders. The region has a relatively developed private sector, numerous NGOs and CBOs and cooperatives. These organizations play a critical role in the provision of services in rural areas.

Africa Regional Nutrition Strategy (ARNS, 2015–2025)

The ARNS builds on the global targets for nutrition improvements, and aims to improve nutrition in Africa through a 40% reduction of stunting among children under 5 years; 50% reduction of anemia among women of child-bearing age; 30% reduction of low birth weights; no increase of overweight in

children under 5 years of age and women; 50% increase in exclusive breast-feeding during the first six months of life; and to reduce and maintain wasting among children under 5 to less than 5%. The strategy recognizes the importance of nutrition sensitive agriculture, and the need for transformation of African agriculture to provide food and nutrition security. This calls for a paradigm shift towards improving both quantity and quality of food produced in member countries such as Kenya. The strategy, however, fails to take into recognition climate change issues.

EAC Food Security Action Plan (EAC-FSAP, 2011–2015)

Adopted in 2011, the action plan aims to guide the implementation and actualization of regional food security issues, as outlined in the various EAC instruments. Among the key priorities of the action plan is to fast track the development of an EAC Food and Nutrition Security Policy. The EAC-FSAP recognizes the role of climate change in the agriculture sector by influencing production, productivity, food access, availability and utilization and the need for adaptation. The action plan priority interventions include enabling policy, legal and institutional frameworks, increasing food availability in sufficient quantity and quality, improving the stability of food supply and access, enhancing the efficiency of food utilization, nutrition, and food safety, through strategy implementation, monitoring and resources in EAC countries including Kenya. The action plan does not include any climate change mitigation interventions, including exploring the opportunities presented by the adaptation options that have co-benefits for reducing GHG emissions.

EAC Food and Nutrition Security Policy (EAC-FNSP, 2014)

The EAC-FNSP aims to ensure food security and adequate nutrition for the people of East Africa throughout their life cycle, for their health as well as their social and economic wellbeing. Some of the specific objectives relevant to Kenya include: i) Increasing the quantity and quality of food, including those of animal origin, and to ensure that all East Africans have adequate, diverse and healthy diets in a sustainable manner; ii) Reducing post-harvest losses and promoting value addition through the food production value chain; iii) Increasing food availability at all times, using measures that ensure the availability of food reserves to curb food-related emergencies; iv) Increasing trade between member states and other regions inside and outside of Africa and ensuring realistic import duties on food items; v) Providing timely information and research findings for evidence-based action on food and nutrition security; and vi) Reducing vulnerability to emergency situations through timely risk reduction measures. This policy acknowledges the impacts of climate change on the attainment of food and nutrition security and recommends planned adaptation through drought preparedness, prevention and mitigation measures to cushion the negative impacts.

EAC Food and Nutrition Security Strategy (EAC-FNSS, 2018–2022)

The overall goal of the EAC-FNSS is to attain food and nutrition security for all the people of the EAC, for their health as well as their social and economic well-being. There are several constraints to achieving food and nutrition security in the region. These include low adoption of improved agricultural technologies, poor access to inputs, climate variability and change, limited market integration and poor

pre- and post-harvest management among others. The strategy acknowledges that agricultural transformation in EAC Partner States such as Kenya can be more sustainable as producers adopt new approaches that allow production to thrive and adapt to changing climate conditions. Critical activities that need support from partner states include: i) Development of regional multi-sectoral frameworks on implementation of food security under climate change; ii) Promoting strengthened regional level capacity, information and knowledge sharing, communication and research on climate change and food and nutrition security; iii) Promoting agricultural and food systems research, education, and extension that increase productivity and innovation as well as protect consumers; and iv) Promoting sustainable and inclusive production and productivity of crops, animal and animal resources, fisheries, aquaculture, apiculture and forest products. Implementation of the strategy requires focused and well-coordinated efforts of the EAC as an institution working in collaboration with all levels of the national and sub-national governments of Partner States.

EAC Food and Nutrition Security Action Plan (EAC-FNSAP, 2018–2022)

The EAC-FNSAP goal is to contribute to the elimination of hunger, malnutrition, and extreme poverty in the six EAC Partner States (i.e. Kenya, Burundi, Rwanda, South Sudan, Tanzania and Uganda) by 2022 through: i) Improving sustainable and inclusive agricultural production, productivity and trade of crops, animal and animal resources, fisheries, aquaculture, apiculture and forest products; ii) Strengthening resilience among households, communities and livelihood systems by promoting sustainable utilization of natural resources, environmental conservation and uptake of disaster risk reduction with enhanced post-harvest value addition; and iii) Improving access and utilization of nutritious, diverse and safe food. The action plan is aligned to the EAC-FNSS, 2018-2022, and is informed by and contributes to global, continental and regional food security commitments (e.g. EAC agriculture and food security instruments, CAADP and SDGs).

The strategy recognizes climate change as an emerging driver of food security in East Africa due to the high dependence of households on rain-fed agriculture in Partner Sates such as Kenya. In particular, the pastoral livestock production systems are identified to be the most vulnerable to climate change impacts. It highlights opportunities and response measures to address climate change: i) Research to provide new tools and approaches for increasing agricultural productivity, monitoring and managing threats and risks, better natural resource management and climate change adaptation; ii) Creating awareness about the effects of climate change on food security and recommend appropriate adaptive interventions; iii) Regional collaboration and investments that cut across the borders; and iv) Integrating historical and future climatic information to inform adaptation of agricultural systems.

Table 4 provides a summary of the extent to which some of the regional policies and frameworks on agriculture and food and nutrition security reviewed integrate climate change.

Table 4. Integration of climate change in regional policies and frameworks on agriculture, food and nutrition security

Regional policies and frameworks on agriculture, food and nutrition security	Climate change		Weighted average scores (%)
	Adaptation	Mitigation	
CAADP	3.1	3.1	62
CAADP FAFS	2.4	2.4	48
EAC-FSAP	2.6	2.3	49
Malabo Declaration	2.3	0.0	12
EAC-ARDP	2.4	0.0	12
EAC-FNSP	2.4	2.8	52

National development frameworks and policies relevant to climate change, agriculture, food and nutrition security

Over the years, the Government of Kenya has developed frameworks and policies to enhance economic growth cutting across the different sectors. This chapter reviews some of the national development frameworks and policies relevant to climate change, agriculture food and nutrition security: Economic Recovery Strategy for Wealth and Employment Creation (ERS), Kenya Vision 2030, Green Economy Strategy and Implementation Plan (GESIP), Kenya Rural Development Strategy, Kenya National Social Protection Policy, Environmental Management and Coordination Act, National Water Master Plan 2030, and National Land Policy.

Economic Recovery Strategy for Wealth and Employment Creation (ERS, 2003–2007)

The ERS lays emphasis on economic growth, creation of wealth and employment and revitalization of the agriculture sector as a means of eradicating poverty and achieving food security through good governance, transparency and accountability (GoK 2003). The strategy identified agriculture as the leading productive sector for economic recovery. In addition, the strategy recognized that revival of agricultural institutions and investment in agricultural research and extension were critical and essential for reduced poverty, food insecurity and sustainable economic growth. Chapter 6 of the ERS document was solely dedicated to productive sectors. Section 6.2 on agriculture and fishing in particular attributes the decline in agricultural productivity to poor institutional governance and capacity, lack of a comprehensive legal framework to consistent policies, poor access to farm credit, high cost of farm inputs, insecurity in certain parts of the country, high prevalence of HIV/AIDS, low level of public funding and inefficient use of public resources, inefficient infrastructure and inappropriate technology that is unresponsive to variations in agro-ecological zones. While the ERS emphasized improving agricultural productivity, food and nutrition security, it failed to take into consideration issues of climate change adaptation and mitigation. For example, Chapter 7 of the ERS recognizes interventions in health and nutrition as one of the ways of promoting equity and the socio-economic agenda. Section 7.8 is focused on food and nutrition and the Kenyan Government committed to eliminate vitamin A deficiency in under 5-year olds by 2005 by promoting awareness campaigns on the benefits of improved nutrition, and production and consumption of nutritious food.

Kenya Vision 2030

Vision 2030 is a long-term development blueprint and a roadmap for Kenya's economic and social development covering the period 2008–2030, replacing the ERS. Vision 2030 aims to transform Kenya into "a newly industrializing, middle income country providing a high quality of life to all its citizens in a clean and secure environment by the Year 2030" (GoK 2007). Vision 2030 identifies agriculture as a key sector in achieving a sustained GDP growth rate of 10% annually. Under the Vision, smallholder agriculture is to be transformed from "subsistence production, marked by low productivity and value addition" to "an innovative, commercially oriented and modern agricultural sector". The country's food

and nutrition security are often linked to the performance of the agricultural sector (GoK 2011). Specific agriculture issues under the Vision include: i) Transforming key institutions in agriculture and livestock to promote household and private sector agricultural growth; ii) Increasing productivity of crops and livestock. Other interventions include introduction of new land use policies through better use of high and medium potential lands, developing more irrigable areas in arid and semi-arid lands for both crops and livestock, and improving market access for smallholders through better supply chain management. For food and nutrition security, the areas of focus include food availability, food accessibility, food stability, and utilization of nutritious food. Food insecurity may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution or inadequate use of food at the household level.

Climate change and environmental issues do not explicitly feature in Vision 2030. However, environmental considerations of development are captured within the social and economic components. In addition, the Kenyan Government has put in place a wide range of policy, institutional and legislative frameworks to address the major causes of environmental degradation and negative impacts on ecosystems emanating from industrial and economic development programs. Some of these are discussed in the sections below and examples include the Environmental Management and Coordination Act of 1999 (EMCA) and the National Environment Policy (NEP) among others. In addition, Kenya is a signatory to a number of international treaties on climate change such as the UNFCCC, Kyoto Protocol, Paris Agreement and Copenhagen Accord. Several national policy and institutional frameworks have been also put in place to address climate change, and these are discussed in detail in section 5 of this review.

Green Economy Strategy and Implementation Plan (GESIP, 2016–2030)

The GESIP underpins Kenya's commitment to transition to a green economy in line with the outcome of the United Nations Conference on Sustainable Development (UNCSD) held in 2012 (Rio+20 Summit) (GoK 2016a). In addition, GESIP outlines an avenue for functional interaction between economic development and the SDGs. It focuses on five themes to guide Kenya's transition to a sustainable development pathway: i) sustainable infrastructure development; ii) building resilience; iii) resource efficiency; iv) sustainable natural resource management; and v) social inclusion, and sustainable livelihoods. To build resilience, it promotes development and enhancement of agricultural infrastructure to improve food and nutrition security, increase rural incomes and reduce poverty levels. Efforts under this theme focus on ensuring the economy and livelihoods are less vulnerable to risks and challenges of climate change and growth dynamics. It further promotes climate change adaptation and mitigation through building resilience and enhancement of low carbon development pathways. Other components include integrating emerging climate change and variability actions into sectoral development strategies.

Climate Risk Management Framework (CRMF, 2016)

The CRMF integrates disaster risk reduction, climate change adaptation, and sustainable development to be pursued as mutually supportive rather than stand-alone goals in order to improve the quality of

actions and contribute to the overall goal of building a climate-resilient nation. It promotes an integrated climate risk management approach as a central part of policy and planning at national and county levels. The priority areas of focus include harmonizing programs and projects and creating a coordination mechanism, including designing and implementing pilot projects at the county and national level; creating an enabling policy and legal framework for integrated climate risk management; building capacity at the national and county level for integrated climate risk management; analysis of the level of exposure, vulnerability to disasters, and capacity at the local scale; involving communities at risk, and considering gender and marginalized groups; mobilizing resources for climate risk management; mainstreaming climate risk management into sector programs, plans and activities; enhancing research and dissemination of information about climate risk management; and creating platforms for sharing lessons and good practices on integrated climate risk management.

Implementation of the framework is jointly led by the National Drought Management Authority (NDMA) at the Ministry of Devolution and Planning and the Climate Change Directorate (Ministry of Environment and Forestry), working closely with a wide range of partners.

Big Four Agenda (2018–2022)

The Government of Kenya Big Four Agenda establishes priority areas for 2018 to 2022, with sector plans and budgets aligned to the Big Four priorities. The Big Four Agenda focuses on four priority areas that include food and nutrition security, universal health coverage, manufacturing and affordable housing as summarized below:

- Food and nutrition security: achieve food and nutrition security for all Kenyans by 2022 through enhancing large-scale production, boosting smallholder productivity, and reducing the cost of food.
- Universal Health Coverage: ensure all Kenyans have access to affordable healthcare, focusing on restructuring the National Hospital Insurance Fund (NHIF), and reforming the governance of private insurance companies.
- Manufacturing: increase the sector's share of GDP from about 9% in 2017 to 15% in 2022 through interventions that support value addition. Key areas and sub-sectors prioritized include agri-processing, leather, textiles, oil, mining and gas, iron, steel and production of construction materials, investing in information and communication technologies (ICTs), promoting ease of doing business, establishing industrial parks/zones, and promoting market access.
- Affordable housing: with a target to build 500,000 affordable housing units by 2022 to improve the living conditions and provide decent homes, create an additional 350,000 jobs, provide markets for manufacturers and suppliers and increase the contribution of the real estate and construction sector to GDP. Specific policies and administrative reforms will be implemented aimed at lowering the costs of construction and improving accessibility of affordable mortgages.

Kenya Rural Development Strategy (KRDS, 2002–2017)

The KRDS aims at improving rural Kenya and considers food security promotion, attainment of poverty alleviation, equitable growth and development in rural areas. The KRDS was a roadmap for government, private sector, civil society (religious groups, NGOs, rural communities, CBOs) and other development partners. Several policy actions and interventions were implemented within the KRDS framework to facilitate rural development, with agriculture providing the stimuli, resources and markets. Agricultural growth must serve as the catalyst for broad-based economic growth and development. Through forward and backward linkages to the non-farm economy, agriculture will generate raw materials, employment, income, larger markets and growth in the rest of the economy.

Kenya National Social Protection Policy (KNSPP, 2011)

This KNSPP ensures that all Kenyans live in dignity and exploit their human capabilities for their own social and economic development. The policy is organized around five broad objectives: i) Protecting individuals and households from the impact of adverse shocks to their consumption; ii) Supporting households and individuals to manage these shocks in ways that do not trap them in poverty by reducing their exclusion and strengthening their ability to graduate from social assistance and to become financially self-sufficient; iii) Cushioning workers and their dependents from the consequences of income threatening risks such as sickness, poor health, and injuries at work as well as from the threat of poverty in their post-employment life; iv) Promoting key investments in human capital and physical assets by households and individuals that ensure their resilience; and v) Promoting synergies and integration among social protection providers.

Environmental Management and Coordination Act (EMCA, 1999)

The EMCA provides an appropriate legal and institutional framework for the management of the environment and related matters, including the Convention of Biological Diversity (CBD), one of the outcomes of the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. In addition, Kenya has been implementing other international development treaties like Agenda 21 and the SDGs related to environmental protection and sustainable development. The Act provides for the establishment of the National Environment Council (NEC) and the National Environment Management Authority (NEMA). NEMA is responsible for the coordination of all matters relating to the environment and implementation of all policies relating to the environment. The EMCA has been revised (2012) and Amended (No. 5 of 2015) to incorporate climate change—the Cabinet Secretary for the Ministry of Environment shall, in consultation with relevant lead agencies, issue guidelines and prescribe measures on climate change.

National Water Master Plan (NWMP, 2030)

The NWMP recognizes that Kenya has not fully developed its irrigation potential estimated at 1.34 million hectares. This is based on surface and underground water, including water harvesting and storage. It identifies that approximately 12% of the potential has been equipped with irrigation

infrastructure, presenting an opportunity to increase productivity to meet the rising demand for food and other agro-products. The plan proposes formulation of irrigation development programs and financing to build infrastructure and a well-equipped human resource capacity for sustainable operations and management. It also proposes the establishment of an institutional arrangement for efficient management and coordination to facilitate enhanced participation of stakeholders to embrace business-oriented irrigated agriculture. The plan integrates climate change and agricultural aspects but makes no mention of food and nutrition security.

National Land Policy (NLP, 2009)

The NLP focuses on sustainable and equitable use of land, including actions to address environmental problems such as land degradation, soil erosion and pollution. The overall objective of the policy is to secure rights over land and provide for sustainable growth, investment and reduction of poverty in line with national development objectives. It encourages sustainable intensification of use in high-potential and densely populated areas through the application of efficient methods and improvement of the condition and productivity of degraded lands, as well as through application of cost-effective irrigation methods. The policy seeks to balance different, yet related, concerns such as food security, human settlements, environmental protection, and climate change. It also recognizes social, cultural, economic, political, and spatial dimensions of development.

National policies and frameworks on climate change

Kenya has made great strides in strengthening national actions in response to climate change through various frameworks and policies. The main policies, frameworks and plans to guide climate change actions in Kenya are summarized in Table 5. In this chapter, we review these frameworks and policies, including the extent to which they integrate agriculture, food and nutrition security (Table 6). In addition, Kenya has submitted its first and second national communication to the UNFCCC in 2002 and 2015, respectively. At the national level, several ministries and departments have established climate change units and climate change-related plans and policies to guide and mainstream climate actions in their sectors.

Kenya National Climate Change Response Strategy (NCCRS, 2010)

The NCCRS is the first national policy document in Kenya on climate change. It focuses on ensuring climate change adaptation and mitigation measures are integrated in all government planning and development objectives. This calls for collaborative and joint action with all stakeholders (public and private sector, civil society, NGOs, etc.) in tackling the impacts of climate change. The emphasis is to prioritize the most vulnerable sectors of the economy—agriculture and food security, water, forestry, rangelands, health, social and physical infrastructure for quick and immediate action—while simultaneously providing explicit measures for addressing climate change in Kenya and defining the criteria to track the effectiveness of such measures. Adaptation measures for agriculture (crops and livestock) within the NCCRS include provision of downscaled weather information and farm inputs; water harvesting for irrigation; protection of the natural resource base (e.g. soil and water conservation); research and dissemination of superior crops (e.g. drought tolerant, salt-tolerant, pest and disease resistant); developing livestock insurance schemes; breeding of animals that adapt well to climatic vagaries; improved livestock management practices; promotion of economic livelihood diversification; and sustainable land use in pastoral areas. Mitigation measures outlined for agriculture include appropriate use of biotechnologies for increasing productivity and reducing GHG emission intensity, proper management of agricultural waste, and promotion of agroforestry, especially tree-based intercropping and promotion of organic farming.

Table 5. Kenya's national climate change legal and policy framework

National framework	Description
Kenya Vision 2030 (2008) and Medium-Term Plans	Vision 2030 is the country's development blueprint. It recognizes climate change as a risk to the country's development. Climate change actions were identified in the Second Medium Term Plan (MTP) (2013-2017). MTP III (2018-2022) recognizes climate change as crosscutting and mainstreamed climate change actions in sector plans.
National Climate Change Response Strategy (2010)	NCCRS is the first national policy document on climate change, with the aim of advancing integration of climate change adaptation and mitigation into all government planning, budgeting, and development objectives.
National Climate Change Action Plan (2013–2017)	NCCAP is a five-year plan aimed at supporting Kenya's low carbon climate resilient development goals with defined adaptation, mitigation and enabling actions.
National Adaptation Plan (2015-2030)	Kenya's NAP was submitted to the UNFCCC in 2017. It provides a climate hazard and vulnerability assessment and identifies priority adaptation actions in the 21 planning sectors in MTP II.
Kenya's Nationally Determined Contribution (2016)	Kenya's NDC under the Paris Agreement includes mitigation and adaptation contributions. For adaptation, Kenya will ensure enhanced resilience to climate change towards attainment of Vision 2030 by mainstreaming climate change into the MTPs and implementing adaptation actions. For mitigation, Kenya seeks to abate its GHG emissions by 30% by 2030 relative to the BAU scenario of 143 $MtCO_2eq$."
Climate Change Act (No. 11 of 2016)	The Climate Change Act is the first comprehensive legal framework for climate change governance for Kenya and aims to enhance climate change resilience and low carbon development for sustainable development of Kenya.
Climate Risk Management Framework (2017)	CRMF integrates disaster risk reduction, climate change adaptation, and sustainable development to be pursued as mutually supportive rather than stand-alone goals. It promotes an integrated climate risk management approach as part of policy and planning at National and County levels.
National Climate Change Framework Policy (2018)	NCCFP aims to ensure integration of climate change into planning, budgeting, implementation and decision-making across all sectors of the economy both at National and County levels.
National Policy on Climate Finance (2018)	NPCF establishes the legal, institutional, and reporting frameworks to access and manage climate finance—with the goal of supporting Kenya's national development goals through enhanced mobilization of climate finance that contributes to low-carbon climate resilient development.
Big Four Agenda (2018–2022)	Big Four Agenda establishes priorities areas for 2018 to 2022—ensuring food security, affordable housing, increased manufacturing and affordable healthcare. Sector plans and budgets are to be aligned to the Big Four priorities.

Source: GoK 2018.

National Climate Change Action Plan (NCCAP, 2013–2017)

The NCCAP (2013-2017) is Kenya's first action plan on climate change launched in 2013 to implement the NCCRS (2010). NCCAP identifies priority adaptation and mitigation measures and provides information on how to integrate these options into national development planning, budgeting and objectives in key economic sectors including agriculture. NCCAP acknowledges agriculture's sensitivity to climate change and its great potential for synergies among the objectives of food security, poverty reduction, adaptation and mitigation. The priority adaptation actions for agriculture include coordination and mainstreaming of climate change into agricultural extension, establishment and maintenance of climate change related information for agriculture, and upscaling specific adaptation and mitigation actions. These actions included promotion and bulking of drought tolerant crops, water harvesting, agroforestry, conservation agriculture, index-based weather crop insurance and integrated soil fertility management. These practices have significant adaptation benefits, while improving agricultural production potential and reducing GHG emissions. For livestock, NCCAP recommends improved management of grazing systems, biogas, livestock diversification, and improved breeding of animals to increase productivity, all of which are particularly important for the Arid and Semi-arid Lands (ASALS). It advocates for collaboration and joint action in tackling the impacts of climate change, as well as stronger planning and institutional capacity development including at the community level (GoK 2010). It also explores financial instruments available from public and private sector funding, multilateral initiatives, carbon markets and other sources of funding. An updated action plan has been developed for the period of 2018-2022.

National Adaptation Plan (NAP, 2015–2030)

The NAP builds on the foundation laid by the NCCRS and the NCCAP. The NAP is Kenya's first plan on adaptation. The NAP sets out Kenya's national circumstances focusing on current and future climate trends and vulnerability assessment including institutional arrangements for monitoring and evaluation processes (GoK 2016b). The NAP aims to consolidate Kenya's vision on adaptation to enhance resilience and adaptive capacity and demonstrates the country's commitment to operationalize the NCCAP by mainstreaming adaptation across all sectors in the national planning, budgeting and implementation processes. Additionally, the NAP is the basis for the adaptation component of Kenya's Intended Nationally Determined Contribution (INDC) that was submitted to UNFCCC in 2015. The NAP consolidates the country's vision on adaptation supported by macro-level adaptation actions that relate with the economic sectors and county level vulnerabilities to enhance long-term resilience and adaptive capacity. Specific objectives of the NAP include: i) Highlighting the importance of adaptation and resilience building actions in development; ii) Integrating climate change adaptation into national and county level development planning and budgeting processes; iii) Enhancing resilience of public and private investments in the national transformation, economic and social and pillars of Vision 2030 to climate shocks; iv) Enhancing synergies between adaptation and mitigation actions for a low carbon climate resilient economy; and v) Enhancing resilience of vulnerable populations to climate shocks through adaptation and risk reduction strategies.

The NAP identifies short-, medium- and long-term priority actions for 20 planning sectors in MTP II, and clearly recognizes that the agriculture sector is highly sensitive to climate, and negatively affected by climate variability. Priority adaptations actions for agriculture in the short-term within the NAP include promoting indigenous knowledge on crops, increasing awareness on the impact of climate change on agriculture value chains, conducting climate risk and vulnerability assessments of agriculture value chains, coordinating and mainstreaming climate change adaptation into agricultural extension, and diversifying diets. Medium- and long-term priority actions include establishing, maintaining and promoting the uptake of climate change-related information on agriculture, supporting the adaptation of private sector agricultural value chain actors through capacity building, promoting and implementing CSA practices and innovations—promotion and bulking of drought tolerant crops, water harvesting for crop production, index-based insurance, conservation agriculture, agro-forestry and integrated soil fertility management. The NAP also takes into account and integrates agriculture, food and nutrition security.

National Climate Change Framework Policy (NCCFP, 2016)

The NCCFP defines a low carbon climate resilient development pathway for Kenya, focusing on mechanisms to enhance climate resilience and adaptive capacity, and the transition to low carbon pathways. In addition, the NCCFP aims to mainstream climate change into planning, budgeting, implementation, and decision-making at the national and county levels across all sectors of the economy. The policy is intended to facilitate a coordinated, coherent, and effective response to the challenges and opportunities presented by climate change and implemented together with the Climate Change Act providing the enabling environment for implementation of the Act. The policy establishes a funding mechanism to enable implementation of priority actions for climate resilience and low-carbon growth, and to explore avenues for attracting internal and external climate finance. The NCCFP recognizes the potential of the agricultural sector to reduce GHG emissions through sequestration of carbon in trees/biomass and soils through agro-forestry, improved pasture and range land management, conservation agriculture, efficient dairy production systems, and improved manure management. It underscores the importance of an enabling policy environment for investment in the agriculture sector for the creation of green jobs.

Climate Change Act (CCA, 2016)

The CCA of Parliament is the first comprehensive national legal regulatory framework for development, management, implementation and regulation of mechanisms for an enhanced response to climate change in order to strengthen resilience and achieve low carbon development across all sectors by the national and county governments (No. 11 of 2016) (GoK 2016c). The CCA also creates a framework for a climate change governance structure at national and county levels and adopts a mainstreaming approach that includes integration of climate change considerations into all sectors and in County Integrated Development Plans (CIDPs). The CCA established the National Climate Change Council (Section 5); Climate Change Directorate (Section 9) as the lead government agency on national climate change actions, Climate Knowledge Centre within the Ministry of Environment and Forestry; and Climate

Change Fund (Section 25) as a financing mechanism for priority climate change actions and interventions. These institutions are already in place as specified in the CCA.

National Policy on Climate Finance (NPCF, 2018)

The NPCF aims to improve the country's ability to mobilize adequate resources for effective climate change response. The policy seeks to position Kenya to better access domestic and international climate finance through a variety of mechanisms—to address its climate change and low-carbon climate resilient national development agenda, including the goals set out in its NDC following the 2015 Paris Agreement. Climate finance includes all finance specifically targeting low-carbon or climate-resilient development—domestic budget allocations, public grants and loans from bilateral and multilateral agencies, and private sector investment. The policy establishes the legal, institutional, and reporting frameworks to access and manage climate finance. The formulation of the policy was initiated within the framework of the Climate Change Act (2016) and the National Climate Change Action Plan (NCCAP, 2013-2017). Specific objectives of the policy include: enhancing and streamlining implementation of public finance management in relation to climate financing; establishing mechanisms to mobilize internal and external climate finance; tracking, monitoring, accounting for, evaluating and reporting on sources, applications and impacts of climate finance; enhancing capacity of the country to mobilize climate change finance to support sustainable development; and encouraging and facilitating private sector participation in climate relevant financing opportunities. In addition, the policy encourages building capacity to develop bankable projects and effectively manage and implement those projects. Among the strategic interventions in the policy is the creation of a Climate Change Fund (CCF) to encourage the mobilization of climate finance and increase financial flows, including tools to track climate finance.

Kenya's Nationally Determined Contribution (NDC)

Kenya seeks to undertake an ambitious mitigation contribution towards the Paris Agreement. Kenya, therefore, seeks to abate its GHG emissions by 30% by 2030 relative to the BAU scenario of 143 $MtCO_2eq$, and in line with its sustainable development agenda. Achieving the NDC targets is subject to international support on finance, investment, technology development and transfer, and capacity building. As highlighted in the NDC, Kenya's total GHG emissions are relatively low, standing at 73 $MtCO_2eq$ in 2010, out of which 75% are from the land use, land-use change and forestry (LULUCF) and agriculture sectors. This is attributed to increasing demand for agricultural land, urban development and reliance on wood fuel by a large proportion of the population. The NDC will promote and implement mitigation activities on: expansion in renewable and clean energy and technology options, enhancement of energy and resource efficiency across the different sectors; achieving a tree cover of at least 10% of the land area of Kenya, low carbon and efficient transportation systems, CSA in line with the National CSA Framework, and sustainable waste management systems. For agriculture, livestock development and fisheries, priority adaptation actions within the NDC are to enhance the resilience of the agriculture, livestock, and fisheries value chains by promoting CSA and livestock development.

National Climate Change Action Plan (NCCAP, 2018–2022)

The Climate Change Act (2016) requires that the NCCAP is reviewed and updated every five years. NCCAP (2018-2022) is Kenya's second action plan on climate change and builds on the first Action Plan (2013-2017). This second action plan provides mechanisms and measures to achieve low carbon climate resilient development to achieve Kenya's development goals and aligns climate change actions with the national development agenda, including the Big Four. In addition, the action plan provides a framework for Kenya to deliver on its NDCs under the Paris Agreement and mainstream climate change into sector functions at national and county levels, while encouraging participation from all stakeholders. The priority climate change actions identified within NCCAP (2018-2022) cut across all sectors of the economy including agriculture (GoK 2018).

Priority adaptations actions for increasing food and nutrition security as part of the Big Four Agenda are through climate actions in the agriculture sector—crops, livestock and fisheries. Climate change has the potential to prevent the achievement of the Big Four goal on food and nutrition security. NCCAP (2018-2022) provides a range of actions to transform the agricultural sector, with adaptation actions prioritized and taking precedence over mitigation actions. However, many of the actions in agriculture also reduce GHG emissions—agroforestry, sustainable land management, and efficiency in livestock management, providing mitigation co-benefits. These actions focus on implementation of the Kenya CSA Strategy (2017-2026). Specific actions include improving crop, livestock and fisheries productivity through the implementation of CSA interventions and improved irrigation (for crops), livelihood diversification, and enabling action through technology and knowledge management such as the development and implementation of climate information plans by county governments. The county governments are the main implementing agents of many climate actions in a locally appropriate manner that accounts for the unique needs of their populations. These actions will be supported by a number of other relevant institutions at county and national levels: Council of Governors, Ministry of Agriculture and Irrigation (MAI), Ministry of Water and Sanitation (MWS), Water Resources Authority (WRA), Kenya Forest Service (KFS), Kenya Meteorological Department (KMD), Kenya Agriculture and Livestock Research Organization (KALRO), private sector, World Agroforestry Centre (ICRAF), International Livestock Research Institute (ILRI), and farmer, fisher and pastoralist organizations.

NCCAP (2018-2022) also identifies cross-cutting enabling actions to support the delivery of priority climate actions and includes enabling policy and regulatory frameworks; capacity development and knowledge management; technology and innovation; climate finance; and measurement, reporting and verification (MRV).

Integration of agriculture, food and nutrition security into climate change policies and frameworks

Table 6 summarizes the scoring on integration of agriculture and food and nutrition security into the national climate change policies and frameworks, based on the response of the diverse respondents interviewed. The weighted scores were relatively high, ranging from 66% for the NCCRS to 77% for the Climate Change Act (2016). In general, Kenya has prioritized increasing agricultural productivity (crops, livestock and fisheries) and food security (availability) in its climate change frameworks. The absence of harmonized or standardized tools to measure the extent and level of integration, highlights the need to develop a monitoring and evaluation tool to measure progress on the integration of climate change, agriculture, food and nutrition security policies, strategies, and frameworks across scales. In particular, the devolved governments through the CIDPs provide a mechanism to integrate climate change, agriculture, food and nutrition security policy and legislative instruments at local scales. Already, some counties in Kenya are in the process of cascading national climate change, policies and frameworks into their development plans and budgeting. Examples include Makueni, Wajir and Kitui counties that have put in place legislation to integrate climate change into their development plans and budgeting.

Table 6. Integration of agriculture, food and nutrition security into national climate change policies and frameworks

National policies and frameworks on climate change	Agriculture	Food and nutrition security			Weighted average scores (%)
	Productivity	Availability	Access	Utilization	
Climate Change Act (2016)	5.0	3.3	3.9	3.2	77.0
National Climate Change Framework Policy (2016)	4.0	3.7	3.2	3.1	70.0
National Climate Change Action Plan (2013)	3.9	3.3	3.1	3.3	68.0
National Adaptation Plan (2016)	4.4	2.9	2.9	3.1	67.0
Kenya National Climate Change Response Strategy (2012)	3.8	3.4	3.4	2.6	66.0
Average score	**4.2**	**3.3**	**3.3**	**3.1**	**69.6**

National policies and frameworks on agriculture, food and nutrition security

Kenya's agriculture is mainly rainfed, with climate variability and change, including frequent and severe extreme weather events, posing additional risks and uncertainties to the country's agricultural production and food and nutrition security. Kenya has made significant progress in mainstreaming climate change into the planning and budgeting for the different sectors of the economy as discussed in the previous section, of which the agriculture sector and food security feature prominently. Climate-informed policies and institutional frameworks governing agriculture, food and nutrition security are important in providing an enabling environment for building farmers' resilience and adaptive capacity within the context of a changing climate and for stimulating economic growth. In this section, we review the various policies and frameworks for agriculture, food and nutrition security (Table 7), including the extent to which they integrate climate change adaptation and mitigation (Table 8).

Agriculture Sector Development Strategy (ASDS, 2010–2020)

This 10-year ASDS builds on the achievements of the Strategy for Revitalizing Agriculture (SRA 2004-2014). Consistent with Kenya Vision 2030, NCCRS and CAADP, the strategy envisages a food secure and prosperous nation (GoK 2010), all of which recognize agriculture's contribution to accelerated economic growth. The strategy aims to achieve a paradigm shift from subsistence to an innovative, commercially oriented, and modern agriculture. The overall aim of this strategy is to make the agricultural sector a key driver for achieving the 10% annual economic growth rate expected under the economic pillar of Vision 2030. The overall development and growth of the agriculture sector is anchored in two strategic areas: i) Increasing productivity, commercialization and competitiveness of agricultural commodities and enterprises; and ii) Developing and managing key factors of production. The strategy outlines the agricultural policies, institutional reforms, and programs and projects that the government will implement in the short- and long-term to achieve these goals. Climate change is explicitly covered under improving management of the environment and natural resources, with a focus on implementing the NCCRS, recognizing that climate variability has a bearing on the way the environment and natural resources are managed and affect agricultural activities.

Table 7. Kenya's national agriculture, food and nutrition security legal and policy framework

National framework	Description
Agriculture Sector Development Strategy (ASDS) (2010-2020)	Provides a framework for transforming agriculture into an innovative, modern and commercially viable sector. Kenya's CAADP commits the government to implementing the common vision of the sector, as described in the ASDS to address the agricultural development agenda in the country.
Kenya Climate-Smart Agriculture Strategy (KCSAP) (2017-2026)	Recognizes climate change as an emerging issue for food and nutrition security, and advocates for adaptation interventions to build resilience of agricultural systems and adapt to climate change while minimizing GHG emissions for enhanced food and nutritional security and improved livelihoods.
Agriculture Sector Transformation and Growth Strategy (ASTGS) (2019-2029) Abridged Version	The strategy aims to transform the agriculture sector in Kenya to ensure food and nutrition security over a period of 10 years.
Kenya Climate-Smart Agriculture Implementation Framework (KCSAFP) (2018-2027)	Provides guidelines for implementing CSA approaches, practices and technologies at national and county government levels, taking into account local contexts and the countries' global obligations.
National Agricultural Research System Policy (2012)	The overall objective of this policy is to create an enabling environment for a vibrant agricultural research system that contributes effectively to national development. The policy seeks to enhance coordination among various players operating in research and development.
Strategic Plan for Agricultural and Rural Statistics (2015-2022)	Developed together with the Kenya National Bureau of Statistics, the plan seeks to support monitoring and evaluation of the performance of agricultural development policies.
National Agricultural Sector Extension Policy (2011)	The policy seeks to empower the extension clientele through sharing information, imparting knowledge and skills, and changing attitudes so that they can efficiently manage their resources for improved quality of livelihoods.
National Food and Nutrition Security Policy (2011)	The policy aims to effectively address food insecurity and malnutrition by increasing the quantity and quality of food available, accessible and affordable to all Kenyans at all times.
National Food and Nutrition Security Policy Implementation Framework (2017-2022)	Implementation Framework is a tool for effective implementation of the National Food and Nutrition Security Policy, in a comprehensive and coordinated manner to improve food and nutrition security.
Agriculture and Food Authority Act (No. 13 of 2013) revised edition 2019	The Act provides for establishment of the Agriculture and Food Authority and seeks to streamline the legislative framework governing the agriculture sector at county and national levels.

National framework	Description
National Livestock Policy (2019)	The policy aims at transforming the livestock sector from subsistence to commercialized undertaking by applying modern technologies acquired through continuous research and innovations. It advocates for close inter-sectoral linkages between national and county governments.
National Oceans and Fisheries Policy (2008)	This policy focuses on the promotion, implementation and monitoring of sustainable management and responsible fishing practices. The policy notes the role that fisheries play in food security, creation of employment, and other economic benefits to those engaged in the industry.
Agricultural and Livestock Research Act (2013)	The Act provides for the establishment and functions of the Kenya Agricultural and Livestock Research Organization (KALRO) for the co-ordination of agricultural research activities in Kenya.
National Agribusiness Strategy (2012)	The strategy aims to guide the development and transformation of the agricultural sector towards its re-orientation from subsistence to a new focus on competitively meeting market demands and commercialization.
Fisheries Management and Development Act (2016)	The Act aims to protect, manage, use and develop the aquatic resources in an ecologically sustainable manner to enhance food security, and the Kenya Fisheries Advisory Council, Kenya Fisheries Service and Fish Levy Trust Fund.

Kenya Climate-Smart Agriculture Strategy (2017–2026)

The Kenya CSA Strategy aims to build the resilience of agricultural systems and adapt to climate change while minimizing GHG emissions for enhanced food and nutritional security and improved livelihoods. KCSAS acknowledges that existing national strategies and interventions have not adequately mainstreamed climate change adaptation and mitigation in the agricultural sector. Moreover, there is inconsistency between agriculture, food security and climate change leading to inefficiencies in implementation of climate change. Kenya's NDC has outlined CSA as a strategy to implement adaptation and mitigation actions in the NCCAP, underscoring the need for a sound and enabling strategy that simultaneously addresses climate change adaptation and mitigation, rural development, food security and environmental management.

Specifically, the strategy seeks to: i) Enhance the adaptive capacity and resilience of farmers, pastoralists and fishing communities to the adverse impacts of climate change; ii) Develop mechanisms that minimize GHG emissions from agriculture; iii) Create an enabling regulatory and institutional framework; and iv) Address cross-cutting issues that adversely impact or enhance CSA. In addition, KCSAS acts as a tool for implementing Kenya's NDC for the agriculture sector. Four broad strategic areas have been identified for KCSAS:

- Adaptation and building resilience by addressing vulnerability due to changes in precipitation and temperature, extreme weather events and unsustainable land/water management and utilization;
- Mitigation of GHG emissions from key and minor sources in the agriculture sector;
- Establishment of an enabling policy, legal and institutional framework for effective implementation of CSA; and
- Minimizing effects of underlying cross-cutting issues such as human resource capacity and finance which would potentially constrain realization of CSA objectives.

Agriculture Sector Transformation and Growth Strategy (ASTGS, 2019–2029)

The ASTGS Abridged Version builds from the Revitalizing Agriculture Strategy (2004-2014) and ASDS (2010-2020). The strategy aims to transform the agriculture sector in Kenya to sustainably support economic development in the context of devolution, drive 100% food and nutrition security and longer-term continental and global commitments to the Malabo Declaration under CAADP and SDGs (GoK 2019). The ASTGS is anchored in three outcomes to drive the 10-year transformation: i) Increasing small-scale farmer, pastoralist and fisherfolk incomes; ii) Increasing agricultural output and value addition; and iii) Increasing household food resilience.

The strategy prioritizes flagship projects for implementation in the first five years and includes:

- Targeting 1 million farmers, pastoralists and fisherfolk in an initial 40 zones served by 1000 farmer-facing SMEs that provide inputs and equipment;
- Shifting nationwide subsidies focus to register 1.4 million needy farming households, empowering them to access a range of inputs from multiple providers;
- Setting-up six agro-processing hubs across the country through a one-stop-shop rapid public-private partnership (PPP) process for local and export markets;
- Unlocking 50 new large-scale private farms (>2,500 acres each) with 150,000 acres under sustainable irrigation from existing infrastructure;
- Restructuring of the Strategic Food Reserve (SFR) to better serve 4 million needy Kenyans through competitive digital reserve stock and cost management with the private sector, and price stability;
- Boosting food resilience of 1.3 million farming, pastoralist, and fishing ASAL households through community driven design of interventions, and more active coordination of development partners and private sector resources through regional economic blocs.

These flagship projects require enabling actions, of which three are important for the ASTGS: i) Building knowledge and skills for those at the forefront of the transformation; ii) Investing in research and data platforms; and iii) Monitoring food system risks in sustainability, climate-resilience and crises management (e.g. emerging pests, diseases, climate and global price shocks etc.). Performance of these

projects will be reviewed before an additional set of projects is developed for the subsequent five years. The strategy has a potential to improve the lives of 3.3 million small scale farmers (approximately 15 million Kenyans), and contribute significantly to the agricultural GDP. The strategy addresses the need for climate change adaptation in agriculture through offering incentives such as tax breaks on climate-smart technologies, but fails to incorporate the mitigation potential of the agriculture sector.

Kenya Climate-Smart Agriculture Implementation Framework (KCSAIF, 2018–2027)

The KCSAIF provides guidelines for implementing CSA approaches, practices and technologies at national and county government levels, taking into account local contexts and Kenya's global obligations – as a signatory to the Kyoto Protocol and the Paris Agreement. Agricultural growth and development are important for economic growth and development in Kenya. The purpose of the framework is to promote climate resilient and low carbon growth sustainable agriculture that ensures food security and contributes to national development goals in line with Kenya Vision 2030. The KCSAIF is organized around four objectives: i) Developing a sustainable system for achieving a coordinated, coherent and cooperative governance of climate resilience and low carbon growth in the agricultural sector; ii) Mainstreaming CSA to support the transformation of Kenya's agricultural sector into an innovative, commercially oriented, competitive and modern industry that contributes to poverty reduction and improved food security in Kenya; iii) Reducing vulnerability of agriculture systems by cushioning them against the impacts of climate change and reducing GHG emissions where possible; and iv) Strengthening communication systems on CSA extension and agro-weather issues. The objectives will be achieved through the implementation of actions designed around four components:

- **Institutional coordination:** Strengthen national inter-ministerial collaboration, enhance coordination between the national and county governments, and provide an enabling policy and institutional environment for the realization of the overall purpose of KCSAIF;
- **Agricultural productivity and integration of value chain approach:** Transform Kenya's agricultural sector into an innovative, commercially oriented, competitive and modern industry by supporting establishment of efficient and effective value chains. This will support a shift in smallholder production strategies from subsistence to satisfying market demand through the use of improved technologies and enhanced linkages;
- **Building resilience and appropriate mitigation actions:** Building resilience and associated mitigation co-benefits to address issues related to soil health and land degradation; water and natural resources; insurance and other safety nets; building of synergies in adaptation and mitigation measures; and
- **CSA knowledge, extension and agro-weather services:** Raise awareness and strengthen mainstreaming of communication systems to transmit timely information on CSA extension and agro-weather issues among value chain actors. In addition, support local stakeholders to access and adopt methodologies, as well as influence the local planning systems that support CSA.

The framework is aligned to Kenya Vision 2030 ASDS (2010-2020), CCPF (2015), NCCRS (2011), NCCAP (2013-2017), NAP (2015-2030), and KCSAS (2017-2026). In addition, the framework contributes to

Kenya's efforts to adapt and build resilience in agriculture, including contributing towards meeting the NDC commitments submitted to the UNFCCC.

National Agricultural Research System Policy (NARSP, 2012)

The policy aims to establish an integrated national agricultural research system to guide and support the development of an innovative, commercially oriented, and modern agricultural sector including the design of a novel funding mechanism for agricultural research that ensures adequacy, predictability and sustainability of research; and to formulate a comprehensive framework for building partnership and collaboration with stakeholders. Other objectives include harnessing the best science, technology and indigenous knowledge in accordance with professional ethics and scientific judgment, for implementing the agreed research agenda; and promoting an effective delivery system that facilitates prompt application of agricultural research results and services. The policy proposes the establishment of a corporate body to coordinate and facilitate all aspects of agricultural research development—KALRO. The policy recognizes the need to integrate environmental management and in particular mitigation of biodiversity losses, and adaptation to changes in climate in the country's research agenda.

Strategic Plan for Agricultural and Rural Statistics (SPARS_KEN 2015–2022)

The SPARS_KEN is the first-generation agricultural statistics sector plan for Kenya aligned to the ASDS (2010-2020). The plan was developed together with the Kenya National Bureau of Statistics (KNBS), in recognition of the fact that a lack of relevant, reliable and up-to-date agricultural statistics can be a major constraint both for the development of strategies and policies in the sector and for monitoring and evaluation. The plan aims to provide credible data required to inform and undertake the planning process, compilation of reliable national accounts, monitor sector performance, monitor and evaluate the impact of agricultural development policies and programs, and contribute to the decision-making process. The plan covers data and information on crops (including irrigation and inputs), food security, food safety and nutrition; livestock (including apiculture); fisheries (including marine/in-land fisheries and aquaculture); forestry, environment and natural resources; and cross-cutting areas namely legal frameworks/institutional development for agricultural statistics and governance. However, it does not integrate climate change adaptation and mitigation.

National Agricultural Sector Extension Policy (NASEP, 2012)

The NASEP aims to empower the extension clientele through information sharing, imparting knowledge and skills, and changing attitudes to ensure they efficiently manage their resources for improved quality of livelihoods (GoK 2012). This will be achieved through promoting pluralistic extension service provision and management, guiding the operations of Extension Services Providers (ESPs) through an established independent regulatory body to ensure provision of quality extension services, establishing an implementation framework for projects and programs providing extension services, harmonizing extension approaches and methods including empowering grassroots organizations to deliver extension services, strengthening established frameworks for stakeholder linkages including those responsible for providing extension facilitating factors, and compelling ESPs to mainstream cross-cutting issues in

extension messages. The policy focuses on increasing productivity to enhance competitiveness, improving the extension service system through human-power development, better utilization of ICTs and efficiency in resource use, and improving linkages among research, extension (both public and private) and farmers in order to provide a more interactive interplay between the stakeholders. The NASEP recognizes cross-cutting issues critical for the delivery of extension but does not integrate climate change adaptation and mitigation.

National Food and Nutrition Security Policy (FNSP, 2011)

The national FNSP aims to achieve adequate nutrition for optimum health of all Kenyans; increase the quantity and quality of food available, accessible and affordable to all Kenyans at all times; and protect vulnerable populations using innovative and cost-effective safety nets linked to long-term development (GoK 2011). The policy aims to add value, build synergies, and support the implementation of existing national and sectoral policies and strategies to effectively address food insecurity and malnutrition. The FNSP focuses on food availability and access including school nutrition and nutrition awareness, food security and nutrition information, early warning and emergency management, institutional and legal frameworks and financing and strategic approaches for policy implementation, monitoring, and evaluation. The specific actions outlined in the policy include nutrition counseling on healthy diets, physical activity and healthy lifestyles, food fortification, food distribution and supplementation for prevention of acute malnutrition and infectious disease, food safety, food security and agriculture. The policy puts emphasis on climate change adaptation, recognizing the need for development of adaptation interventions to enhance resilience of farming communities to climate change as critical for realizing its objectives. In order to ensure a sustainable increase in food production that is diversified, affordable and meets nutritional requirements, the policy recognizes the need to promote the integration of climate change adaptation in agricultural development programs and policies, improve forecasting of climatic change and support communities to respond to new opportunities and challenges. Specific measures to address the challenges of climate change to food and nutrition security outlined in the policy include: i) Emphasis on strategies aimed at enabling local communities to effectively adapt to climate change and reduce impacts on food and nutrition security; ii) Institutionalizing drought management, e.g. through creating institutions such as the Drought Management Authority and Drought Contingency Fund especially to support drought-prone ASAL areas; iii) Adopting an anticipatory and preventive risk management approach; iv) Systematizing the use of drought preparedness, prevention and mitigation measures; v) Promoting rainwater harvesting and boreholes for irrigation and livestock use, in particular for the ASAL areas.

National Food and Nutrition Security Policy Implementation Framework (FNSP-IF, 2017–2022)

Based on the national FNSP, the implementation framework is designed to serve as a tool to guide all stakeholders—government, private sector, NGOs and other stakeholders—in effectively implementing the national FNSP in a comprehensive and coordinated manner to improve and ensure the food and nutrition security requirements of Kenyans. The FNSP-IF promotes sustainable intensification and

diversification of agricultural production systems in high and medium potential agro-ecological areas. The FNSP-IF further addresses the resilience of livelihoods to disasters through emergency preparedness, response, recovery, building resilience and long-term development.

The main goals of the implementation framework include ensuring that all Kenyans have the means to access affordable, nutritious and personally acceptable foods; guaranteeing a sustainable, safe and high quality food supply; and promoting food consumption patterns that maximize health and minimize disease. The FNSP-IF provides an overarching framework covering the multiple dimensions of food security and nutrition improvement. The policy guides the development of programs, strategies, or action plans, and may be contextualized at all levels to satisfy the needs of diverse social economic and ecosystem settings. The framework covers all the four dimensions of food security—availability, accessibility, stability and meeting nutritional requirements. In addition, the FNSP-IF integrates the major policies, objectives, programs, institutional structures, and related actions into a cohesive approach to managing the multifaceted challenges of food and nutrition security.

Agriculture and Food Authority Act (AFAA, 2013 – Revised Edition 2019)

The AFAA provides for the consolidation of the laws on the regulation and promotion of agriculture, and provides for the establishment of the Agriculture and Food Authority, in order to make provision for the roles of the national and county governments in agriculture excluding livestock and related matters in accordance with the relevant provisions of the Fourth Schedule to the Constitution of Kenya. Previously, the subsector has been governed by multiple legislations, and the Act seeks to consolidate the laws relating to agriculture and agricultural land-use in order to boost agricultural production and ensure food security. The specific functions of the Authority in consultation with the county governments, are clearly specified in the Act and include: i) Administering the Crops Act in accordance with the provisions of this Act; ii) Promoting best practices and regulating activities in the agricultural value chain excluding livestock products as provided under the Crops Act; iii) Maintaining a database on agricultural products excluding livestock products; iv) Determining research priorities in agriculture; and v) Advising the national and county governments on agricultural levies.

The AFAA has been amended to the Agriculture and Food Authority Act (via Act No. 7 of 2016 and Act No. 35 of 2016) – revised edition 2019. "Agriculture" in this Act therefore means cultivation of land and use of land and water for any purpose of husbandry and food production. Under the Act, each county government shall, within its area of jurisdiction, be responsible for agricultural matters in accordance with Part 2 of the Fourth Schedule to the Constitution of Kenya.

National Livestock Policy (NLP, 2019)

The NLP is aligned with the national and agricultural sector development strategies and identifies measures to enable the livestock sub-sector to enhance its contribution to food and nutritional security, provide raw materials for agro-based industries, and contribute to improved livelihoods. The policy acknowledges that the livestock sector is vulnerable to the impacts of climate change and variability, including extreme weather events. Increasing temperatures and change in precipitation patterns and

amounts have led to reduced livestock productivity resulting from reduced feed and water availability. In particular, livestock has been affected by drought leading to death of animals, emergence, and re-emergence of traditional and new diseases, and spread of pests beyond previously colonized ecological zones. The policy emphasizes the improvement of livestock management systems for sustainable development of the livestock industry due to frequent droughts that affect livelihoods dependent on the livestock sector.

To address the climate change related challenges for the livestock sector, the policy states that the national government will: i) Facilitate the implementation of legislation and action plans related to climate change; ii) Develop capacities and technologies to enhance adaptation to and mitigation of the effects of climate change; iii) Strengthen early warning systems and disaster preparedness; and iv) Support programs to improve the resilience of livestock keepers to the effects of climate change. The county governments will: i) Promote public awareness, capacity building and the sharing of information on sustainable environmental practices; ii) Promote adoption of climate change adaptation technologies and mitigation interventions; iii) Implement policies, legislations and action plans relating to climate change; and iv) Ensure disaster preparedness and implement response measures. Jointly, the two levels of government (i.e. national and county governments) will promote the selection and development of appropriate breeds and forage varieties, keeping of animals of higher productivity, green growth strategies, climate financing, and support adoption of insurance to mitigate climate risks.

National Oceans and Fisheries Policy (NOFP, 2008)

The NOFP aims to enhance the fisheries sector's contribution to wealth creation, increased employment for youth and women, food security, and revenue generation through effective private, public and community partnerships. The policy focuses on the promotion, implementation and monitoring of sustainable management and responsible fishing practices. It also focuses on the promotion of fish consumption as a means to increasing food security, employment, income and foreign exchange earnings, arising from trade and related activities. It also aims at securing the rights of vulnerable and traditional fisher communities. The NOFP proposes ecosystem-based sustainable exploitation of fishery resources conservation and management through the use of adaptive and environmentally sustainable technologies and best international practices for increased production and productivity. It further enforces fish handling standards that minimize post-harvest losses. The policy acknowledges that the effect of climate change, the impact of deforestation and land degradation, the introduction of alien species and the loss of critical habitats negatively affects fish production.

Agricultural and Livestock Research Act (ALRA, 2013)

The ALRA promotes, streamlines, coordinates and regulates research in crops, livestock, genetic resources and biotechnology in Kenya and expedites equitable access to research information, resources and technology, and promotes the application of research findings and technology in the field of agriculture. While the Act integrates agriculture, it is silent on matters related to climate change, food and nutrition security. The ALRA provides for the establishment and functions of KALRO to coordinate of

agricultural research activities in Kenya. The Act recognizes that agricultural research is a key component of technology generation, knowledge management and technology transfer to provide solutions for the sustainable development of agribusiness in Kenya. While the Act does not explicitly mention climate change, food nutrition and security, KALRO is undertaking research and implementing projects which focus on these issues. For example, KALRO is implementing the European Union (EU) supported Climate Smart Agricultural Productivity Project (CS APP) whose overall objective is productive, climate change adapted, and market integrated smallholder agriculture aiming to reduce the national food deficit and improve agriculture sector competitiveness.

National Agribusiness Strategy (NAS, 2012)

Under Vision 2030, smallholder agriculture is to be transformed from subsistence production—characterized by low productivity and value addition—to "an innovative, commercially-oriented, internationally competitive and modern agricultural sector." Agribusiness has been identified as one of the key drivers of this agricultural transformation. Under NAS, agribusiness comprises all businesses involved in the agricultural value chain: agricultural production, seed supply, agrochemical, farm machinery, wholesale and distribution, processing, marketing and retail sales. The strategy aims to guide the development and transformation of the agricultural sector towards its re-orientation from subsistence to a new focus on competitively meeting market demands and commercialization.

The NAS addresses the needs of small-, medium- and large scale farming and business operations, with a focus on four objectives: i) Removing barriers and creating incentives for the private sector to invest in agribusiness and related business opportunities; ii) Investing public resources more strategically to trigger growth in agribusiness; iii) Making agribusiness systems more competitive and easily adaptable to deal with dynamic markets and the opportunities they bring; and iv) Encouraging the right kind of institutional frameworks that enable all actors to utilize market opportunities. These objectives will be realized through five strategic priorities. These include putting markets at the centre of all production, processing, product development and packaging; focusing research and development and innovation to better catalyze growth of a vibrant agribusiness sector; promoting smarter organization of the actors in the sector to enable enterprises to benefit from economies of scale and improved productivity; improving the range and effectiveness of financial and non-financial services; and attracting investment by creating an enabling environment. The strategy acknowledges climate as a risk to agriculture and small businesses (along with emerging diseases and market trends) and emphasizes the need to more reliable and better information on risks, including strengthening and enhancing early warning systems to reduce losses.

Fisheries Management and Development Act (FMDA, 2016)

The FMDA is an Act of Parliament to provide for the conservation, management and development of fisheries and other aquatic resources in an ecologically sustainable manner in order to improve the livelihood of communities dependent on fishing. The guiding principles of the Act include conservation and protection of fisheries habitats, ensuring effective application of the ecosystem approach to

fisheries management, maintaining and enhancing the biodiversity and genetic diversity in the marine environment, encouraging the participation of users of the fisheries resources, and the general community in the management of fisheries.

The FMDA establishes the Kenya Fisheries Advisory Council, an advisory body responsible for reviewing and advising the national government on policies in relation to the coordination of fisheries management; allocation and access to fisheries resources; intergovernmental agreements and arrangements related to fisheries; research, education, capacity development in fisheries and management of fisheries resources; and management plans and resources for the development of the sector. The Act also establishes the Kenya Fisheries Service, responsible for the conservation, management and development of Kenya's fisheries resources; and the Fish Levy Trust Fund to provide supplementary funding of activities geared towards management, development and capacity building, awards and urgent mitigation to ensure sustainability of the fisheries resource.

Integration of climate change into agriculture, food and nutrition security policies and frameworks

In most African countries climate change adaptation is considered a priority, with mitigation often considered as a co-benefit of adaptation. A summary of the scoring on integration of climate change into the national agriculture, food and nutrition security policies and frameworks is presented in Table 8, based on the opinion of the diverse respondents interviewed. Similar to many African countries, Kenya has prioritized climate change adaptation in its frameworks on agriculture, food and nutrition security, with the average weighted relevance score ranging from 31% to 95% (Table 8). Therefore, adaptation actions that have mitigation benefits are highly prioritized. The KCSAS and KCSAIF had the highest weighted scores (95% and 92%, respectively), implying a very high level of integration of climate change adaptation and mitigation into these frameworks. However, the Strategy for Revitalizing Agriculture (SRA), National Agricultural Research System Policy (2012) and National Oceans and Fisheries Policy (2008) had the lowest weighted relevance scores (31%) (Table 8), with no integration of mitigation.

Table 8. Integration of climate change into agriculture, food and nutrition security policies and frameworks

National policies and frameworks on agriculture, food, and nutrition security	Climate change		Weighted average scores (%)
	Adaptation	Mitigation	
Kenya Climate Smart Agriculture Implementation Framework (2018–2027)	5.0	4.5	95
Kenya Climate Smart Agriculture Strategy (2017–2026)	5.0	4.2	92
National Livestock Policy (2015)	4.3	3.6	79
Agriculture Fisheries and Food Authority Act (2013)	4.3	1.8	61
Agriculture Sector Development Strategy (2010-2020)	3.2	2.1	53
National Agricultural Sector Extension Policy (2012)	2.3	0.0	46
National Food and Nutrition Security Policy (2011)	3.4	0.0	34
Strategy for Revitalizing Agriculture (2004-2014)	3.1	0.0	31
National Agricultural Research System Policy (2012)	3.1	0.0	31
National Oceans and Fisheries Policy (2008)	3.1	0.0	31
Average score	**3.68**	**1.62**	**55.3**

Other agriculture sub-sector specific policies and legislation are summarized below:

- Pyrethrum Industry Policy
- National Seed Industry Policy
- Agricultural Sector Gender Policy
- Crops Act (2013)
- Sugar Policy and Amendment of Sugar Act (2001)
- Cotton Policy and Repeal of Cotton Industry Act
- Amendment of Coffee Act (2001)
- National Potato Industry Policy 2005
- Cooperative Development Policy (2008)
- National Banana Development Strategy

Most of these policies and frameworks have greater emphasis on enhancing agricultural productivity, access, and utilization, but with indirect implications on climate change adaptation.

Projects and programs on climate change, agriculture, food and nutrition

The review also examined the extent to which projects and programs (previous and current) focusing on agriculture, food and nutrition security integrate climate change adaptation and mitigation.

Njaa Marufuku Kenya (NMK, 2005-2015)

The NMK Program (translated as eradication of hunger in Kenya) was developed by the Ministry of Agriculture Livestock and Fisheries (MoALF) in 2005 to contribute to the Millennium Development Goal (MDG 1), focusing on reducing poverty, hunger and food insecurity among poor and vulnerable communities. This program gives grants to farmer groups and schools to produce their own food. MoALF, in collaboration with FAO, has disbursed a total of KSh. 327.6 million to 1,866 groups, 40 schools and 35 organizations to undertake food security projects. The project supported community driven agricultural development initiatives targeting extremely poor and vulnerable groups. Interventions are geared towards increasing agricultural productivity, food utilization, agro-processing and value-addition, health and nutrition improvement, water harvesting and conservation of the natural resource base to ensure sustainability of the production systems.

Economic Stimulus Programme

The Stimulus Programme was informed by the need to cushion earmarked subsectors of the economy from the slump occasioned by internal and external factors, including the financial crisis and the rising high prices witnessed in 2008/2009. Specific objectives of relevance to the agriculture sector included boosting the country's economic recovery, expanding economic opportunities in rural areas for employment creation, promoting regional development for equity and social stability, investing in the conservation of the environment, renewable energy and food security. Specific examples include boosting food production through irrigated agriculture projects in Bura, Mwea South, West Kano, Perkerra Tana Delta, Ahero, Bunyala and Hola in Tana River.

Enhancing Agricultural Productivity Project

This project seeks to increase access to agricultural inputs and technologies targeting smallholder farmers in selected districts. The project has three major components: i) Scaling-up of the existing agricultural credit program (Kilimo Biashara) at a cost of Euro 5.07 million, building on the partnerships already established between the government, the International Fund for Agricultural Development (IFAD), the Alliance for a Green Revolution in Africa (AGRA), and Equity Bank to leverage additional credit and scale-up loans to farmers; ii) Scaling-up the existing input voucher scheme (Kilimo Plus) in selected districts through the Government's National Accelerated Agricultural Inputs Access Program (NAAIAP) at a cost of Euro 9.47 million; iii) Scaling-up of the orphan crop program at a cost of Euro 3.08 million, focusing on supplying planting materials of orphan crops (including sorghum, cassava and millet) to smallholder farmers in semi-arid areas.

Kenya Cereal Enhancement Programme-Climate Resilient Agricultural Livelihoods Window (KCEP-CRAL)

The KCEP-CRAL program aims to reduce rural poverty and food insecurity among smallholder farmers in Kenya, with a focus on the arid and semi-arid lands by developing their economic potential, improving their natural resource management capacity and resilience to climate change. These goals will be pursued in two ways: i) Graduation of smallholder farmers to commercially oriented, climate-resilient agricultural practices through improvements in productivity, post-production management practices and market linkages for targeted value chains; and ii) Empowerment of county governments and communities to sustainably and consensually manage their natural resources and build resilience to climate change. The program area covers eight semi-arid counties in the Eastern and Coastal regions of Kenya, with an estimated combined population of over 5 million people[3]. The counties were selected based on agroecological suitability and production potential of maize, sorghum, millet and associated pulses, which are important to Kenya's food security; incidence of poverty; vulnerability to climate change; geographical concentration to maximize impact; and presence of similar development programs. The MALF is the lead agency for the program implementation, with a total budget of $118 million. Other partners include Equity Bank, KALRO, AGMARK Eastern Africa Grain Council (EAGC), World Food Programme (WFP), IFAD and EU.

Kenya Agricultural Productivity Project (KAPP)

The KAPP focused on improving technology generation, transfer, and uptake through strengthening institutions for research, extension, and farmer empowerment. More specifically, the program was designed as a 12-year, three-phase Adaptable Program Loan (APL). The objectives included to: i) Facilitate empowerment of farmers to access and apply profitable and sustainable technologies; ii) Lay the groundwork for a pluralistic agricultural extension and learning system; iii) Integrate and rationalize the national agricultural research system (NARS); iv) Support analytical work to inform policy and institutional reform. KAPP was implemented in two phases: KAAP I (2004–2008) and KAPP II (2008-2015). KAPP II was named the Kenya Agricultural Productivity and Agribusiness Program (KAPAP). KAPP I was aligned with the 2004 Country Assistance Strategy goal of reversing Kenya's decline in economic growth and equity. It had four components and included facilitation of policy and institutional reforms, support to extension system research system reforms, and support to farmer empowerment.

The second phase (KAPP II or KAPAP) focused on productivity growth while embracing diversification, value addition, market linkages, and partnerships. It aimed to consolidate and scale up the gains from KAPP I, and address some remaining issues including reforming the research system and expanding technology development and diffusion and agribusiness opportunities. KAPAP's development objective was to "increase agricultural productivity and the incomes of participating smallholder farmers in the project areas." It was implemented at a time of profound transition in Kenya involving major national governance reforms, including a new constitution (introduced in 2010) and commencement of a

[3] Embu, Tharaka Nithi, Kitui, Machakos, Makueni, Taita Taveta, Kwale and Kilifi.

decentralized and devolved system of government in Kenya. These changes shaped the implementation process of the project and its achievements, and the sustainability of its outcomes. KAPAP ended in September 2015. During these two phases of implementation, KAPP was the main form of World Bank support to the agriculture sector in Kenya, with a revolutionary vision to transform the subsistence-oriented smallholder agriculture toward agribusiness and to engage private service providers in the agricultural extension and service delivery system. The total budget for KAPAP was US$ 98.58 million, and the partners included World Bank and MoALF.

National Farmers Information Service (NAFIS)

NAFIS is an information service developed by the National Agriculture and Livestock Extension Program (NALEP), as a comprehensive information service to serve farmers' needs throughout the country by enabling the farmers to get extension information simply by calling the service (NAFIS 020-5100102) or browsing the NAFIS website (www.nafis.go.ke). The service comprises of a detailed website, updated regularly by extension officers, and a Voice-based Service which contains summarized information which farmers' access using mobile phones. Except for the normal charge by the telephone company, NAFIS does not charge any extra costs. The Voice-Service is available both in English and Kiswahili. Themes covered by NAFIS include agriculture topics, natural resource management, processing, post-harvest preservation and marketing. In addition, farmers can also access the latest weather information from the Kenya Meteorological Department (KMD) from the NAFIS website, including other weather forecast products such as 5-day, 7-day, monthly and seasonal forecasts.

Resilience and Economic Growth in Arid Lands - Improving Resilience (REGAL-IR)

The REGAL-IR project works with pastoral and transitional communities to build their capacity to cope with and rebound from economic and environmental shocks such as recurring drought. This project is funded by the United States Agency for International Development's (USAID) and the Feed the Future Initiative with a budget of $45m, implemented in five counties—Turkana, Marsabit, Isiolo, Garisssa, and Wajir. In consultation with community members, the targeted interventions support local structures to improve social, economic and environmental resilience. Main activities include improving the capacity of individuals and community-based enterprises to become more competitive in business and non-pastoral activities, supporting community structures to better manage natural resources and relieve pressure on the environment, supporting community and entrepreneurs access to market information and produce markets, and strengthen capacity to manage conflict; improving consumption of nutritious foods. Other partners included WFP, MoALF and the Ministry of Health in the five counties, NDMA, KALRO, the Center for Sustainable Drylands, Ecosystems and Societies, Population, and Health Integrated Assistance (APHIA +) and the Millennium Water Alliance (MWA).

Kenya Climate-Smart Agriculture Project (KCSAP)

The KCSAP is one of the projects in the agricultural and natural resources sector that is addressing climate change impacts. The project seeks to respond to and reduce adverse effects of climate change and thereby help Kenya meet the rising demand for food, and attain the SDGs of ending poverty (SDG 1), hunger (SDG 2) and combating climate change and its impacts (SDG 13). KCSAP will contribute to the Kenya Vision 2030 and to the Agricultural Sector Development Strategy 2010–2020 (ASDS). The project's objective is to increase agricultural productivity, build resilience to climate change risks (adaptation), and reduce GHG emissions (mitigation) per unit of output (as an adaptation co-benefit) in targeted smallholder farming and pastoral communities in Kenya. KCSAP has four components: i) Up-scaling CSA practices; ii) Strengthening CSA research and seed systems; iii) Supporting agro-weather, market, climate, and advisory services; and iv) Project coordination and management. The estimated project budget is USD 279.7 million to be jointly funded by the Kenyan Government (USD 24.2million) and the World Bank (USD 250 million). The project is implemented in 24 counties[4] covering diverse agro-ecologies, 72 sub-counties and 144 wards. The key implementing agencies include MoALF, KALRO, KMD, and county governments.

Kenya Climate Venture Facility (KCV)

The KCV was founded in 2016, with seed capital from Danida and UKAID. KCV is an independent subsidiary of Kenya Climate Innovation Center (KCIC). It is an independent investment management company based in Kenya, and seeks to accelerate the development of the clean-tech industry by providing much needed tailored and targeted financial and managerial assistance support to innovative early stage businesses. KCV seeks to invest in businesses that have relevant products or services, sustainable competitive advantage, good management teams and ethical business practices. The development objective is to pilot an innovative investment facility that addresses the financing gap for promising start-up and early-stage climate technology companies in Kenya, and to develop investible, sustainable and scalable enterprises that contribute to Kenya's growing climate innovation and clean technology sectors. The project was designed as an important new addition to Kenya's growing venture capital and equity finance eco-system, as the first Kenya based investment company building a new investment model that specifically targets innovative climate focused Kenyan start-ups and early-stage companies considered too risky by venture capital funds and impact investors. The total project budget is USD 4.90 million, and partners include World Bank and KCIC.

[4] Arid—Marsabit, Isiolo, Tana-River, Garissa, Wajir and Mandera; Semi-Arid—West Pokot, Baringo, Laikipia, Nyeri, Tharaka-Nithi, Lamu, Taita-Taveta, Kajiado and Machakos; and Medium-to-high rainfall—Busia, Siaya, Nyandarua, Bomet, Kericho, Kakamega, Uasin-Gishu, Elgeyo-Marakwet and Kisumu.

In Kenya, many agricultural programs and projects are increasingly recognizing the need for integration of climate change, some examples are shown in Table 9. Of the 30 projects and programs evaluated, 20% had a high weighted score (>75%), with the majority (70%) having medium weighted score and 10% having a low weighted score (Table 9).

Table 9. Climate change integration in agriculture and food security programs and projects

Programs and projects	Weighted score (%)
Njaa marufuku Kenya	High (>75%)
Kenya Cereal Enhancement Programme - Climate Resilient Agricultural Livelihood	
Agriculture sector support development programme	
Resilience and Economic Growth in Arid Lands - Improving Resilience	
Economic Stimulus Programme (ESP) in Agriculture Sector	
Dairy Heifer Project	
Increasing Smallholder Productivity and Profitability Project (ISPP)	Medium (50-74%)
Kenya Agricultural Biotechnology Support Programme	
Kenya Climate Smart Agriculture Project	
National Accelerated Agriculture Inputs Programme	
Kenya Agro-dealer Strengthening Programme,	
Low Emission and Climate Resilient Development	
Technical assistance for Kenya Small-Scale Irrigation and Value Addition Project	
Finance for Innovation and Climate Change Fund	
National Farmers Information Service	
National Accelerated Agricultural Inputs Access Programme	
Enhancing Agricultural Productivity Project	
Integration Smallholder Dairy Specialization Programme (SDSP)	
Information on Nutrition, Food Security and Resilience for Decision Making	
Improved Food Security and Resilience for Vulnerable Communities in Kenya	
Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)	
Kenya Adaptation to Climate Change in Arid and Semi-Arid Lands	
Kenya Agricultural Productivity Project	
Promoting nutrition sensitive agricultural diversification to fight malnutrition and enhance youth employment opportunities in Eastern Africa	
Kenya Venture Facility	Low (<50%)
Youth Empowerment in Sustainable Agriculture	

Institutional landscape for climate change, agriculture and food and nutrition security in Kenya

Climate change adaptation and mitigation is increasingly being undertaken by several institutions across scales (global, regional, national and subnational and local levels), similar to initiatives focusing on agriculture, food and nutrition security. At the national level, a few institutions have cross-cutting responsibilities with regards to climate change adaptation, mitigation, agriculture, food and nutrition security. These include NEMA, the National Treasury, the Ministry of Devolution and the ASALS.

At the national level and in accordance with the Climate Change Act of 2016, Kenya has established a Climate Change Directorate (CCD) within the Ministry of Environment and Forestry (MENR) as the lead government agency on national climate change plans and actions. In addition, CCD serves as the national knowledge and information management center for collating, verifying, refining, and disseminating knowledge and information on climate change. KMD within the MENR is the national focal point for the Intergovernmental Panel on Climate Change (IPCC). KMD is a specialized unit responsible for the provision of meteorological and climatological services to agriculture, forestry, water resources management, civil aviation and the private sector. The Department of Resource Surveys and Remote Sensing (DRSRS) is another specialized unit within the MENR. Key functions performed by DRSRS, which directly inform climate change response strategies across sectors include: mapping and monitoring of the vegetation and habitats of livestock and wildlife in Kenya; assessing, mapping and monitoring land cover/use; developing early warning systems (EWS) for crop forecasting used in food security management; vegetation biomass productivity monitoring for range management; and developing Land Information Management Systems (LIMS) from geospatial databases. At the sector level, some ministries have established climate change units or climate change focal points to integrate and coordinate climate change issues. It is anticipated that similar structures will be replicated at the county level.

The national organizations work in close collaboration with various regional and international research organizations. Technology development, transfer, dissemination, diffusion, and innovations are required as a measure to address climate change adaptation and mitigation. Kenya's policy on climate change research as set out in the NCCRS identified specific sectoral research needs as a response to the impacts of climate change, including research needs in agriculture (GoK 2010). The national research organizations—KALRO, Kenya Forestry Research Institute (KEFRI), and Kenya Marine and Fisheries Research Institute (KEMFRI), work in close collaboration with the national universities, regional and international research organizations. These include the CGIAR centers and research programs such as ILRI, ICRAF, the Alliance of Bioversity International and CIAT, the International Institute of Tropical Agriculture (IITA), the International Crops Research Institute for the Semi-Arid · for the Semi-Arid Tropics (ICRISAT), the International Maize and Wheat Improvement Center (CIMMYT) and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). The CGIAR has been engaging with

Kenya's policymakers to influence policy using scientific evidence and promoting specific technological innovations in areas of expertise. CCAFS, for example, has been working with the MoALF and MENR to mainstream climate change into national agriculture strategies and frameworks, and integrate agriculture into climate change policies and frameworks.

Other key actors include Inter-Governmental Organizations (IGOs), NGOs and Civil Society Organizations (CSOs). IGOs working on climate change in Kenya mostly coalesce around FAO, WFP, NEPAD, World Bank, and bilateral organizations, among others. NGOs coalesce around the Kenya CSA Alliance—CARE International, World Vision, Catholic Relief Services, Concern Worldwide, Oxfam and SNV Netherlands Development Organization, among others. The CSOs coalesce around the Kenya Climate Change Working Group (KCCWG) and include the Pan African Climate Justice Alliance (PACJA) and Rainforest Alliance, among others.

Conclusions

This working paper reviewed the current state of policies and frameworks on climate change, agriculture, food and nutrition security in Kenya, including their level of integration. In addition, the review examined the regional, continental and global frameworks on climate change, agriculture and food security that are relevant to Kenya. The review demonstrates increasing efforts and awareness at continental, regional and national levels to strengthen the enabling environment for addressing climate change, improving agricultural productivity, and food and nutrition security through policies, strategies and frameworks. To strengthen national actions on climate change adaptation and mitigation, the government developed the NCCRS (2010), the NCCAP (2013, 2018), NAP (2015 -2030), the Climate Change Act (2016), and the National Climate Change Framework Policy (2018), among others. For agriculture, food and nutrition security some specific frameworks include the NFNSP (2011), NFNSP Implementation Framework (2017-2022), KCSAS (2017–2028), ASTGS (2019–2029), KCSAIF (2018–2027).

Most climate change policies and frameworks integrate agriculture, food and nutrition security, with the majority of the policies and frameworks prioritizing agricultural productivity and food availability. Similarly, most of the agriculture, food and nutrition security policies and frameworks integrate climate change adaptation, with very limited focus on mitigation. As in many African countries, mitigation is often considered as an adaptation co-benefit, thus adaptation actions that have mitigation benefits are highly prioritized. The majority of the national policies and frameworks on climate change, agriculture and food security are aligned to Kenya's long-term national development frameworks—Kenya Vision 2030 and the Big Four Agenda. In addition, the recent policies and frameworks are aligned with the regional, continental and global frameworks such as the SDGs, CAADP and the Paris Agreement.

The review shows that a number of institutions in Kenya are working on climate change and agriculture, with institutional overlaps in some cases in focus areas of interventions. Strengthening institutional arrangements and coordination may help consolidate and promote partnerships among independent institutional efforts. Designing and implementing policies in a coherent, inclusive and integrated manner can provide opportunities for enhancing coordination and integration of climate change adaptation and mitigation efforts across the different sectors, including agriculture. There is an opportunity for national, regional and international research and knowledge generation organizations, including implementation agencies, to play a central role in supporting the development of guidelines, tools and models for monitoring and evaluating progress of integration of climate change, agriculture and food and nutrition security. This is a major area where research organizations such as the CGIAR and CCAFS can capitalize on by establishing effective partnerships with the relevant national stakeholders and institutions and provide evidence and tools. Establishing effective multi-stakeholder platforms, digital databases and information management systems can help in the generation of baseline data for the development of indicators for monitoring and evaluating the integration of the policies and frameworks.

A key question is how these policies and frameworks are implemented and translate into action at the local level. In particular, the devolved governments, through County Integrated Development Plans

(CIDP), provide a mechanism to integrate climate change, agriculture, food and nutrition security policy and legislative instruments. Some counties in Kenya are already cascading and integrating the national climate change, agriculture, food and nutrition security policies and frameworks into their development plans and budgeting. Examples include Makueni, Wajir and Kitui counties which have put in place legislation to integrate climate change in their county development plans and budgeting.

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Annex 1

Table A. Experts interviewed by institution

Organization	Number of experts interviewed
Ministry of Environment, Water and Natural Resources	3
Ministry of Agriculture, Livestock and Fisheries	3
Kenya Agricultural Livestock Research Organization	3
Ministry of Finance, National Treasury and Planning	1
Ministry of Devolution and Planning	1
Ministry of Water and Irrigation	1
Institute of Climate Change Adaptation, University of Nairobi	1
National Institutions of Higher Learning	4
Total	**17**

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