

Climate and livestock policy coherence analysis in Kenya, Ethiopia and Uganda

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

Laurie Ashley

Working Paper



RESEARCH PROGRAM ON
Climate Change,
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Abstract

Livestock in Kenya, Ethiopia, and Uganda play an important role in food security, livelihoods, income, and gross domestic product (GDP). Livestock sector growth in response to growing demand for animal-sourced food requires policy guidance to avoid increasing livestock sector exposure to climate risks and increasing sector greenhouse gas (GHG) emissions. Guided by the Policy Coherence for Sustainable Development Framework, this analysis examines 40 climate, agriculture, livestock, development, land, and environment policies across the three countries for strength and coherence in addressing livestock sector adaptation and mitigation. The policy context is dynamic with numerous policies developed since 2015 particularly in the climate and development policy areas but also for livestock, agriculture, and land. Countries are clearly working to integrate livestock climate change strategies into climate and other policy areas, although at times with limited detail and coherence. More recent policies often provide the most comprehensive approaches and detailed strategies and post-2015 policies are largely aligned with the SDGs with some exceptions. Development partners, including bilateral, multilateral, research, and private sector organizations often play key roles in technical and financial support for policy development related to livestock sector adaptation and mitigation.

In each country, there are examples of strong policy guidance for livestock sector adaptation. Kenya in particular has strong policy coherence around livestock adaptation strategies across policy areas. In Ethiopia, there is policy coherence for livestock adaptation in development policy and more recent climate policy but a lack of adaptation consideration in livestock, agriculture, land, and environment policies. In Uganda, a sub-set of climate policies provide strategies for livestock adaptation, however, other policy areas are weak on this integration. In terms of mitigation in the livestock sector, examples of robust strategies are more limited. Comprehensive mitigation strategies and sufficient consideration of adaptation-mitigation co-benefits remain a gap in many policies across countries and policy areas. Kenyan policies do consistently call for finding adaptation-mitigation synergies but provide little detailed guidance. Ethiopia has the most policy coherence for livestock sector mitigation although this is mainly limited to climate and development policies and one livestock policy.

Keywords

Policy coherence; livestock; climate change; Kenya; Uganda; Ethiopia.

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Acronyms

ASALs	Arid and semi-arid lands
BAU	Business as Usual
BMUB	Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (Germany)
CCAFS	Research Programme on Climate Change, Agriculture, and Food Security
COMESA	Common Market for Eastern and Southern Africa
CRGE	Climate Resilient Green Economy Strategy (Ethiopia)
CSA	Climate-Smart Agriculture
DFID	Department for International Development (United Kingdom)
EAC	East African Community
FAO	Food and Agriculture Organisation of the United Nations
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft fur Internationale Zusammenarbeit
GTP	Growth and Transformation Plan (Ethiopia)
IDRC	International Development Research Centre
IGAD	Inter-Governmental Authority on Development
IISD	International Institute for Sustainable Development
IKI	International Climate Initiative (Germany)
ILRI	International Livestock Research Institute
LIP	Livestock Investment Implementation Plan (Ethiopia)
MISP	Multi-Sector Investment Plan for Climate Resilient Agriculture and Forest Development (Ethiopia)
MRV	Measurement, Reporting, and Verification (in relation to GHG emissions)
MTP	Medium Term Plans

NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan
NAPA	National Adaptation Program of Action
NCCAP	National Climate Change Action Plan (Kenya)
NCCP	National Climate Change Policy (Uganda)
NCCRS	National Climate Change Response Strategy (Kenya)
NDC	Nationally Determined Contribution
NDP	National Development Plan (Uganda)
NEPAD	New Partnership for Africa's Development
PPCR	Pilot Program on Climate Resilience
REDD+	Reduce Emissions from Deforestation and forest Degradation and foster conservation, sustainable management of forests, and enhancement of forest carbon stocks
SDG	Sustainable Development Goal
UN-OHCHR	United Nations Office of the High Commissioner for Human Rights
UN-REDD	United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development

Introduction

The purpose of this policy coherence analysis is to better understand the extent to which identified policies integrate adaptation and mitigation action in the livestock sector and coherence among policies within and between policy areas. The analysis contributes to identifying opportunities for the Programme on Climate-Smart Livestock to engage with policy makers and others to further integrate climate change mitigation and adaptation in livestock policies, livestock into climate policies, and encourage climate smart livestock systems.

Sustainable Development Goal (SDG) 17.14 is to “enhance policy coherence for sustainable development,” emphasising the need to develop synergies and address conflicts and gaps among different policy areas to effectively address cross-cutting challenges. Policy coherence can be defined as “systematic support towards the achievement of common objectives within and across individual policies” (Hertog and Stross 2011, cited in Nilsson et al. 2012). Policy coherence analysis can identify how policies across policy areas (e.g., climate and livestock) support or conflict with one another as well as support or conflict with broader national and international goals (e.g., SDGs).

Background

Livestock in Kenya, Ethiopia, and Uganda play an important role in food security, livelihoods, income, and GDP. With growing populations and incomes in much of this region, there is an increasing demand for livestock products that is driving sector growth. Unguided, this growth could increase livestock sector emissions and the number of livestock at-risk from climate change impacts. In contrast, investments in closing livestock yield gaps through breeding, health, feed, and market efficiencies offer a path towards climate adaptation and mitigation and sustainable sector development (Enahoro, et al., 2019). In addition to specific livestock sector adaptation and mitigation strategies, policies can guide investment in institutions, planning processes, research and development, and capacity building.

Climate change impacts to the livestock sector range from the direct negative productivity impacts of heat, drought, flooding, and other extreme weather to indirect impacts related to disease occurrence and water, feed, and grazing quality and availability (Rojas-Downing, et

al. 2017). A range of context-specific policy options for adaptation exist to increase climate resilience in the livestock sector. These include improved breeding, feed quality and availability, water access, and disease control; shifts in the type of production systems (including diversifying livestock varieties); and increased access to livestock insurance and early warning systems.

Livestock sector emissions are a significant contributor to overall GHG emissions in each country reviewed, particularly in Ethiopia and Kenya. Of livestock emissions globally, enteric fermentation contributes about 63 percent, deposit of manure and urine on pasture about 25 percent, and manure management about 12 percent (Tubiello, et al. 2015). Additional livestock sector-related emissions come from land use change from animal feed production, as well as livestock product storage, processing, and transport. Important policy options to limit livestock sector emissions include reducing emissions and increasing productivity per unit through feed, manure management, health, and optimisation at age of slaughter strategies; limiting, and ultimately sequestering, carbon emissions from grazing and pasture lands (including avoiding deforestation); and shifting demand away from higher emitting livestock species (e.g., cattle) toward lower emitting species (e.g., poultry) or away from the livestock sector altogether (Gerber, et al. 2013).

Adaptation and mitigation measures require coherent policy guidance and substantial investment. The reviewed policy documents demonstrate that Kenya, Ethiopia, and Uganda are exploring a range of options for livestock sector adaptation and mitigation and grappling with balancing sector growth with aims to increase climate resilience and limit sector emissions and as outlined in Nationally Determined Contributions (NDCs) and national policy.

Methods

This analysis employed the Policy Coherence for Sustainable Development (PCSD) framework (OECD, 2016) with a focus on the PCSD analytical framework component. The PCSD framework was developed as a tool to support the SDG agenda and, in particular, SDG 17.14 to “enhance policy coherence for sustainable development.” The PCSD builds on the previous Policy Coherence for Development framework released by OECD in 2012. The PCSD framework provides guidance and a screening tool for, inter alia, analysing coherence issues and how policy actions might support or hinder achievement of SDG goals and targets.

The analytical framework component of the PCSD includes a focus on policy interlinkages among economic, social, and environmental policies and the associated synergies and trade-offs. The policy interlinkage focus is the principal component of this analysis. The PCSD and this analysis also include consideration of the role of various actors, enabling and disabling conditions, sources of finance, and transboundary impacts (Table 1).

Table 1. Policy Coherence for Sustainable Development analytical framework component

PCSD analytical framework main elements	Sample guiding questions
Policy interlinkages	How do the planned policy outputs contribute to achieve sustainable development goals?
Actors	What is the role of the private sector, civil society organisations, bilateral and multilateral donors, and other stakeholders?
Enabling and disabling conditions	Have the contextual factors (corruption, barriers to trade, knowledge, etc.) which might influence the policy outcomes been identified?
Sources of finance	Have all the potential sources of finance been identified (public, private, domestic, international) for sustainable development?
Transboundary impacts	Does the policy produce unintended effects, positive or negative, that could affect the well-being of people living in other countries?

Source: OECD 2016.

The analysis took a content analysis approach (Stemler, 2001) and examined research beyond the policy documents to further explore aspects of policy context. Climate, livestock and agriculture, development, land, and environment policies were analysed for each country (Table 2). Policies that combine a climate and agriculture focus are included in the climate policy area. The review included 40 policies including 14 in Kenya, 13 in Ethiopia, and 13 in Uganda. Documents were analysed and coded using an Excel database to identify the policy elements. Regarding SDGs, the analysis focused on SDG 2 Zero Hunger and SDG 13 Climate Action with the understanding that livestock are a critical source of food, income, and savings for livestock keepers and highly vulnerable to climate change impacts, as evidenced by livestock losses due drought, heatwaves, floods, and gradual trends in temperature and precipitation. And, yet, while livestock are key to food security and livelihoods in much of East Africa, livestock are responsible for a substantial proportion of human-induced GHG emissions in the region.

Table 2. Policies reviewed

Policy Area	Kenya	Ethiopia	Uganda
Climate	<ul style="list-style-type: none"> National Climate Change Response Strategy (NCCRS), 2010 NDC, 2015 NAP, 2015-2030 National Climate Change Framework Policy, 2016 Climate Smart Agriculture Strategy, 2017-2026 Climate Smart Agriculture Implementation Framework, 2018-2027 National Climate Change Action Plan (NCCAP), 2018-2022 	<ul style="list-style-type: none"> NAPA, 2007 Climate Resilient Green Economy Strategy (CRGE), Green Economy Strategy, 2011 Climate Resilient Green Economy (CRGE), Climate Resilience Strategy, 2014 NDC, 2015 Multi-Sector Investment Plan (MISP) for Climate Resilient Agriculture and Forest Development, 2017- 2030 NAP, 2019 	<ul style="list-style-type: none"> NAPA, 2007 NDC, 2015 National Climate Change Policy (NCCP), 2015 National REDD+ Strategy and Action Plan, 2017 NAMA, Climate-smart dairy livestock value chains in Uganda, 2017 NAP-Ag, 2018
Livestock and Agriculture	<ul style="list-style-type: none"> National Policy for the Sustainable Development of Northern Kenya and other Arid Lands, 2012 Draft National Livestock Policy, 2019 	<ul style="list-style-type: none"> Agricultural Sector Policy and Investment Framework, 2010-2020 Livestock Master Plan (LMP), 2015 Livestock Investment Implementation Plan (LIP), 2015-2030 Draft Pastoral Development Policy and Strategy, 2018 	<ul style="list-style-type: none"> National Agriculture Policy, 2013 Agriculture Sector Strategic Plan (ASSP), 2015/16-2019/20
Development	<ul style="list-style-type: none"> Green Economy Strategy and Implementation Plan, 2016-2030 Medium Term Plan (MTP III), 2018-2022 	<ul style="list-style-type: none"> Growth and Transformation Plan (GTP II), 2016-2020 	<ul style="list-style-type: none"> National Development Plan (NDP II), 2015/16-2019/20 Green Growth Development Strategy (GGDS), 2017/18 - 2030/31
Land	<ul style="list-style-type: none"> National Land Policy, 2009 National Spatial Plan, 2015-2045 	<ul style="list-style-type: none"> Draft Integrated Land Use Policy, 2019 	<ul style="list-style-type: none"> National Land Use Policy, 2006 National Land Policy, 2013
Environment	<ul style="list-style-type: none"> National Environment Policy, 2013 	<ul style="list-style-type: none"> Environment Policy, 1997 	<ul style="list-style-type: none"> National Environment Management Policy (NEMP), 1995

Each policy was reviewed for the presence and detail of livestock sector climate change adaptation and mitigation strategies, approaches, and activities and their alignment with SDGs. The analysis of each policy area in the following country sections further describes alignment with national development goals. National development goals were not included in this scoring system. The analysis focused on explicit climate mitigation and climate adaptation strategies and took into consideration strategies that were not explicitly listed as adaptation or mitigation but that were a) listed in policies with overall adaptation and mitigation objectives and b) contributed to adaptation or mitigation.

Table 3. Scoring for policy strength and coherence for livestock sector climate change adaptation and mitigation

Level of coherence	Description	Score
High	The policy strongly aligns with SDGs related to livestock sector 1) adaptation or 2) mitigation. Policy devotes specific attention to climate adaptation and/or mitigation in the livestock sector. The policy includes specific activities, measures, and approaches aligned with SDGs.	3
Partial	The policy supports SDGs related to livestock sector 1) adaptation or 2) mitigation but has relatively fewer details and specific activities, measures, and approaches.	2
Limited	The policy supports the SDGs related to livestock sector 1) adaptation or 2) mitigation but lacks details and specific activities, measures, and approaches.	1
None	There is no evidence that the policy supports the SDGs related to livestock sector 1) adaptation or 2) mitigation.	0

Limitations and further inquiry

The key limitation of this policy analysis is that it reviews policy language but not policy status or implementation. There is a remaining need to determine if and how policies are being implemented and which policies are driving action versus “sitting on the shelf.” Additionally, implementation of particular strategies could vary, positively or negatively, from policy ambition and requires further inquiry.

In terms of actors involved in policy development, the review includes the country level and external (international development institutions and financial mechanisms) actors referenced in the policies themselves. Some policies do not reference external actors but this does not mean external actors were not involved in policy development. Additional research is needed to understand the particular roles of country and external actors in policy development and

implementation. This includes gaining a better understanding of country ownership of policies and their commitment to implementation.

The analysis took the same approach of using references within the policies for identifying policy financing. The level of detail on financing for policy strategies ranged substantially from none at all to detailed budgets with potential financing identified. Further inquiry is needed to learn if and how policies and livestock sector strategies are being financed.

Finally, this review includes selected draft policies. Follow-up is required to determine the status of draft policies and their likelihood and timeline for finalisation (e.g., what are the sticking points, etc.).

Further inquiry could include interviews with country and sector experts within and outside government as well as review of livestock sector adaptation and mitigation projects and activities through interviews and document review.

Summary of findings

The policy context for livestock sector adaptation and mitigation is dynamic across Kenya, Ethiopia, and Uganda with numerous policies developed since 2015. Newer policies are particularly common in the climate and development policy areas but also present for livestock, agriculture, and land. There is clear evidence of the efforts to integrate livestock climate change strategies into climate and other policy areas, although at times with limited detail and coherence. More recent policies often provide the most comprehensive approaches and detailed strategies.

Adaptation receives more attention than mitigation across countries and policy areas. Across policy areas, Kenya has the most consistent policy attention to adaptation while Ethiopia is most consistent for mitigation. In Uganda, outside of the NAP-Ag framework, 2018, and the Nationally Appropriate Mitigation Action (NAMA) for Climate-smart dairy livestock value chains, 2017, the country has dedicated less attention to climate change issues in the livestock sector overall. Comprehensive mitigation strategies and sufficient consideration of adaptation-mitigation co-benefits remain a gap in many policies across countries and policy areas.

Ethiopia has the more policy coherence for livestock sector mitigation although this is mainly limited to climate and development policies and one livestock policy.

Perhaps as expected, land and environment policies provide the least attention to livestock sector adaptation and mitigation strategies followed by agriculture and livestock policies. This points to a general need to better integrate climate and livestock issues into land and environment policy and better integrate climate issues into agriculture and livestock policies. This policy analysis, however, only considers policy language, not implementation. An analysis of policy implementation could reveal different findings.

Kenya has the longest record of strong integration of livestock sector adaptation and mitigation strategies. The National Climate Change Response Strategy (NCCRS), 2010, fully integrates livestock sector adaptation strategies and begins to address mitigation. The later Climate Smart Agriculture Strategy/Implementation Framework, 2018-2027, and National Climate Change Action Plan, 2018-2020, provide the most robust adaptation and mitigation strategies for the livestock sector and are well-aligned with the Sustainable Development Goals (SDGs). There is further policy coherence for livestock sector adaptation among Kenya's livestock, key development, and one land policy. These are these are the Draft National Livestock Policy, National Policy for the Sustainable Development of Northern Kenya and Other Arid Lands, 2012, Second Medium-Term Plan (MTP II) of Vision 2030, 2018-2022, and National Spatial Plan, 2015-2045. These policies, however, have little dedicated attention to livestock sector mitigation.

In **Ethiopia**, the country's Climate Resilient Green Economy (CRGE) Strategy was published in two parts, which taken together provide strong livestock sector climate change strategies. The CRGE-Green Economy, 2011, and the CRGE-Climate Resilience Strategy, 2014, along with the Multi-Sector Investment Plan (MISP) for Climate Resilient Agriculture and Forest Development, 2017- 2030, and the country's key development policy, the Second Growth and Transformation Plan (GTP II), 2016-2020, offer strong treatment and coherence of sector adaptation and mitigation. Additionally, the country's National Adaptation Plan, 2019, is strong on livestock sector adaptation and the Livestock Investment Implementation Plan, 2015-2030, provides mitigation strategies for the dairy and poultry value chains.

Uganda has a somewhat weaker policy record on livestock sector climate change strategies. The recent NAP-Ag framework, 2018, however, goes far in addressing previous gaps.

Additionally, Uganda's Nationally Appropriate Mitigation Action (NAMA) for Climate-smart dairy livestock value chains, 2017, provides robust and thorough mitigation approaches many of which have relevance beyond the dairy sector. Generally, however, development, agriculture, land, and environment policies have limited integration of livestock-climate considerations.

Using the scoring described in the methods section, Table 4 summarizes average livestock sector adaptation and mitigation scores for policy areas by country. These scores give an overall impression of country and policy area attention to climate change in the livestock sector. Scores were determined for each policy based on the strategies, activities, and approaches relevant to climate change adaptation and mitigation in the livestock sector and their alignment with SDGs. These averages are influenced by the range of policies reviewed in each policy area and should be considered in the broader country policy context. The number may hide the weight of stronger policies developed in recent years. In Kenya, for example, the National Climate Change Action Plan, 2018-2022, is likely one of the strongest drivers of climate action and scores a “3” in livestock sector adaptation and mitigation integration. In Ethiopia, the Draft Pastoral Development Policy and Strategy strengthen the country’s livestock adaptation efforts. In Uganda, the NAP-Ag framework, 2018, provides a substantial contribution to livestock sector adaptation which addresses previous policy gaps.

Table 4. Comparison of policy area strength and coherence for livestock sector climate change adaptation and mitigation

Policy Area	Kenya		Ethiopia		Uganda		Policy Area Average
	Adaptation Score	Mitigation Score	Adaptation Score	Mitigation Score	Adaptation Score	Mitigation Score	
Climate Policy	2.5	2	2.5	2	2.3	1.7	2.2
Livestock & Agriculture Policy	3	1	1.5	1	2	0.5	1.5
Development Policy	2	1	3	3	1.5	1	1.9
Land & Environment Policy	1.7	0.7	1	1	1.5	0.5	1.1
Country Average	2.3	1.2	2	1.8	1.8	0.9	

Country's commitments in their Nationally Determined Contributions (NDCs) are consistent around livestock sector adaptation. For mitigation, however, Kenya does not include a livestock reference. Kenya and Uganda, however, both reference climate smart agriculture (CSA) in their NDCs under adaptation and mitigation contributions while Ethiopia does not. Across policy areas, Ethiopia includes almost no reference to CSA. Table 5 illustrates countries' NDC contributions for adaptation and mitigation for livestock and climate smart agriculture broadly. The table does not evaluate the level or detail of the commitment, simply its presence.

Table 5. Comparison of livestock commitments in NDCs across countries

Country	Adaptation Commitment		Mitigation Commitment	
	Livestock	CSA	Livestock	CSA
Kenya	x	x	-	x
Ethiopia	x	-	x	-
Uganda	x	x	x	x

Source: Richards et al. 2016

Post-2015 policies largely state their alignment with the SDGs and some provide more detail about alignment with each SDG. There are a few exceptions to explicit alignment with the SDGs, mainly in Ethiopia. In terms of policy development, development partners, including bilateral, multilateral, research, and private sector organisations often play key roles in technical and financial support for policy development related to livestock sector adaptation and mitigation.

Kenya findings

Across Kenya's climate, livestock and agriculture, development, and land and environment policies, there is clear and consistent recognition of current and projected climate change impacts often with specific focus on the livestock sector. Drought occurrence, and to a lesser extent floods, have driven much of the climate change adaptation consideration for the livestock sector. Policy documents frequently cite observed and projected changes in drought occurrence and rainfall patterns and their impacts on livestock productivity, food security, and livelihoods. The 2008-2011 drought significantly impacted the sector and the country and that

experience has informed much of the subsequent climate, livestock, and development policy. In addition to specific adaptation considerations, many livestock-oriented strategies across policy areas seek to build overall resilience in the sector.

Kenya's Climate Change Act, 2016, is the main legislation guiding Kenya's climate change response. The Act gives the legal mandate for many of the strategies put forth in the country's National Climate Change Response Strategy (NCCRS), 2010, including producing National Climate Change Action Plans (NCCAP) every five years. The Act also establishes a national Climate Change Council and Climate Change Fund. The Climate Change Framework Policy, 2016, outlines strategies to mainstream climate change consideration in institutions, planning processes, research and technology, education, and knowledge management. Planning and implementing climate change strategies receives substantial political support with the President of Kenya sitting as chair of the national Climate Change Council (FAO & UNDP 2017). Climate change considerations are mainstreamed across the policy areas reviewed; only the Land Policy, 2009, does not explicitly consider climate change.

The current NCCAP, 2018-2022, provides the framework to deliver on Kenya's NDC and is aligned with the SDGs, Vision 2030, and Kenya's Big Four Agenda. NCCAP, 2018-2022, thoroughly integrates the livestock sector, particularly through its priority actions for disaster risk management (flood and drought), food and nutrition security, water and the blue economy, and forestry, wildlife, and tourism. The Plan aims to guide climate actions among national and county governments, the private sector, civil society and other actors.

Of climate policies reviewed, the CSA Strategy/Implementation Framework, 2018-2027, provides the strongest recognition of adaptation and mitigation needs in the livestock sector. The strategy was developed as a tool to implement the agricultural components of Kenya's NDC. Policy development was coordinated among the Ministry of Agriculture, Livestock and Fisheries, the Ministry of Environment and Natural Resources, and other government ministries and departments with support from the World Bank (KACCAL project), FAO, and UNDP. The strategy and implementation framework provide a holistic approach that addresses institutional coordination across government and non-government entities and consideration of strategies across the value chain.

Although contributions from the livestock sector form a substantial component of the countries GHG emissions, policy mitigation strategies are often not as strong or lacking.

NCCAP, 2018-2022, explicitly states it prioritises adaptation in its policy goal: “Adaptation actions are prioritised in NCCAP 2018-2022 because of the devastating impacts of droughts and floods, and the negative effects of climate change on vulnerable groups in society...These actions are undertaken, where possible, in a way to limit greenhouse gas emissions to ensure that the country achieves its mitigation NDC.” While livestock sector mitigation strategies are somewhat limited, Kenya has hosted a range of land-based carbon projects and biogas development programs that have relevance for the livestock sector (Nyangena, et al., 2017). This includes the Kenya Agriculture Carbon project, the first project in Africa to issue carbon credits for sequestering carbon in soil. Additionally, CGIAR is supporting the country in developing its first agriculture sector NAMA designed to increase productivity and climate resilience while reducing emissions intensities in the dairy sector by at least 30 percent (CGIAR, n.d.).

Kenya has been highly engaged in Agenda 2030. The SDGs and Africa Agenda 2063 are mainstreamed in the third Vision 2030 Medium Term Plan (MTP III, 2018-2022) and the second-generation County Integrated Development Plans. MTP III recognises climate change as a crosscutting theme and mainstreams climate action in sector plans with a focus on adaptation, including for the livestock sector. The Paris Agreement entered into force for Kenya in January 2017 and now forms part of the law of Kenya per the Constitution. Although Kenya’s 2010 Constitution does not mention climate change, it provides the foundation of climate-related policy. Article 10 sets out national values and principles including sustainable development while Article 42 provides for the right to a clean and healthy environment for the benefit of present and future generations.

The 2010 Constitution has guided a new governance system that has devolved responsibility to County governments and strengthened accountability at local levels. The Constitution also requires public participation in policy making and across the policies reviewed, there are references to stakeholder consultations. The government agenda to further devolve authority and promote more equitable distribution of resources, however, faces limited budgets and governance capacity hinder advancement (USAID 2017a). In the livestock sector, land and water related conflicts continue to impact pastoralists and despite a progressive land policy, land takings for public and private sector investment continue.

External actors in policy development

In terms of external actors in policy development, most climate policies list the involvement of external actors while policies in other areas do not. There may have been external involvement in these policies that is not referenced in the policy itself. Support for climate policy development in Kenya has come from bilateral and multilateral entities (e.g., BMUB, COMESA, Danida/Sida, DFID, EAC, FAO, IGAD, IKI, NEPAD, UNDP, UNEP, World Bank), research and programming entities (e.g., CCAFS, IDRC), as well as a conservation organisation (WWF-Kenya) (see policy summary tables below). Other external actors are only listed generically as development partners.

Kenya climate-livestock policy opportunities for engagement summary

Strongest synergies across policies

- Across policy areas, Kenya policy is strongly focused on adaptation in the livestock sector for intensive and extensive production systems. Policies consistently reference livestock insurance and early warning systems in particular.
- The country's National Climate Change Action Plan, 2018-2022, is likely to be a key driver of climate action and strongly integrates livestock sector adaptation and mitigation strategies.

Key gaps

- Kenya explicitly de-emphasises climate mitigation including in the livestock sector and, while there are calls for synergy among adaptation and mitigation action, there is inadequate consideration of how to achieve adaptation and mitigation co-benefits. Further emphasis on co-benefits through the country's strong focus on CSA could help address this gap.

Potential conflicts

- The country's lack of emphasis and detail on livestock mitigation options could lead to increased livestock sector emissions. The Draft Livestock Policy, 2019, for example, puts in place strategies to promote livestock products with consumers but does not overtly consider the likely increase in livestock emissions that would accompany sector growth. The lack of general policy focus on mitigation could put policies in conflict with the

NCCAP, 2018-2022, and the CSA Strategy/Implementation Framework, 2018-2027, which aim to reduce livestock sector emissions as well as the NDC, which references the county's CSA framework under mitigation activities.

Adaptation synergies, conflicts and gaps

Across climate, livestock, development, land (National Spatial Plan only), and environment policies, there is an effort to mainstream climate considerations in situational analyses and policy strategies. Many policies also call for further mainstreaming of climate change consideration across institutions and planning at national and county levels that support climate resilience and, to a lesser extent, low carbon development. Adaptation strategies in the livestock sector are highlighted across policy areas starting with Kenya's first dedicated climate change policy, the NCCRS, 2010. Additionally, livestock and development policies contain strategies that contribute to overall resilience outside of adaptation specific measures.

There is a balance of policy livestock adaptation strategies addressing near and longer-term adaptation. While there is a clear focus on drought and early warning systems, there is an equally strong focus on livestock insurance options. Additionally, many adaptation actions span timeframes such as those that secure feed and grazing resources and improve water access, livestock breeds, and climate information services. Other longer-term actions detailed include sustainable land management and livelihood diversification.

Expanding water access and irrigation are mentioned across policy areas yet the potential for unintended consequences and maladaptation are rarely explored. While improving water access in this water scarce country is key, increasing dams and accessing ground water has potentially negative impacts on downstream water users and long-term water access (e.g., ground water depletion) that need to be considered to avoid maladaptation.

Coherence among adaptation actions

There is particularly strong alignment across policy areas around adaptation strategies for livestock insurance and early warning systems. Across climate, livestock, and development policies, **livestock insurance** options are consistently highlighted. In the Green Economy Strategy and Implementation Plan, 2016-2030, the only reference to any livestock sector strategy is developing livestock insurance options. The CSA Strategy/Implementation Framework, 2018-2027, provides the most detailed steps to development of “innovative

index-based agricultural insurance packages.” **Early warning systems** and DRR to support the livestock sector in drought and flood management are also mentioned across all policy areas, including land and environment policy, and integrate strategies to support capacity, technology, and communications.

There is also relatively strong alignment around adaptation actions that **secure feed and grazing** options. Actions include improving and conserving fodder and pasture production, establishing irrigated pastures, expanding strategic and emergency feed and fodder storage and grazing reserves, promoting nutrition supplements, and reseeding and restoring rangelands. Improving **water access** for livestock and expanding irrigation, including through water harvesting and dam building, are also commonly cited adaptation options across policy areas. **Sustainable land and natural resource management** are a frequently cited adaptation option among climate policies including strategies such as natural resource inventories, natural resource conflict resolution mechanisms, restoring degraded lands through soil and water conservation practices and other strategies, policy on stocking rates and more. The Draft Livestock Policy, National Spatial Plan, and National Environment Policy also cite sustainable land management or sustainable environmental practices and the MTP III references sustainable land management although not in the context of climate change.

Disease control is a less-so but still fairly commonly cited adaptation measure. The Draft Livestock Policy, 2019, some climate policies (CSA Strategy/Implementation Framework, NCCAP, NCCRS), and the National Spatial Plan reference disease control strategies. The Draft Livestock Policy, 2019, notes the connection between climate change and the “emergence and re-emergence of traditional and new diseases” and existing policy and institutional weakness in monitoring and addressing disease. The policy sets out livestock management, disease surveillance and control, institutional, and policy interventions to address livestock disease that are coherent with disease control strategies in climate policies.

Less commonly cited adaptation strategies include breeding, climate information services, and livelihood diversification. **Improving livestock breeds** through promoting locally adapted and/or exotic breeds is referenced in some of Kenya’s climate policies as well as livestock policies and the National Spatial Plan, 2015. **Climate information systems** are not commonly referenced across policies; however, they are highlighted in the NCCAP and the CSA Strategy/Implementation Framework. The NCCAP sets out to increase the use of

climate information services including among farmers to help manage risk and to inform early warning systems. The CSA Strategy/Implementation Framework aims to increase agro-climate information services and timely use of agro-weather products through several strategies including updating agricultural climate information systems and strengthening ICT platforms for the agriculture sector. Finally, climate policies, although not other policy areas, commonly call for **livelihood diversification** (e.g., value addition) and/or livestock value chain diversification (e.g., new markets) in the livestock sector to support climate resilience.

Implementation challenges

Taking livestock insurance as an example, despite the numerous calls for livestock insurance, only a few insurance companies offer livestock insurance on a commercial basis and mostly cover high value dairy animals. Factors that constrain more extensive uptake of livestock insurance include level or drought and disease risk associated with livestock; limited awareness of insurance products; inadequate data for designing insurance products; limited capacity of pastoralists and small-scale livestock actors to pay premiums; and high cost of delivery of insurance services especially in the arid and semi-arid lands (ASALs) (Draft Livestock Policy, 2019).

Pastoral mobility

While not often cited as an adaptation strategy, pastoralist mobility among strategic land and water resources is key to climate resilience. Across livestock policy there is clear recognition of the important role of mobility for pastoralists and references to promoting and protecting this mobility and the institutional arrangements that support it. The National Land Policy, 2009, asserts that the government shall recognise pastoralism as a legitimate land use and production system and provide for flexible and negotiated cross boundary access to protected areas, water, pastures and salt licks among stakeholders for mutual benefit. And the National Environment Policy states that the government will implement a livestock policy that is cognisant of livestock mobility and communal management of natural resources.

In contrast, across climate and development policy, pastoralists are recognised as a vulnerable group targeted for increased climate resilience but there is no overt recognition of the role of mobility. The NCCAP and CSA Strategy/Implementation Framework, for example, recognise that recurring drought has forced an estimated 30 percent of livestock owners out of pastoralism in the past 20 years but do not directly reference supporting customary pastoral

mobility. The National Spatial Plan recognises that expanding settlements and development infringe on agricultural land but does not reference the need to protect mobility for pastoralists.

Table 6. Policy adaptation strategies: Kenya summary

Policy	Adaptation strategies indicated, Kenya								
	Livestock Insurance	Early warning systems	Feed and grazing	Livestock water access	SLM/NRM	Disease control	Breeds/Breeding	Livelihood diversification	Climate information services
Climate									
NCCRS, 2010	x	x	x	x	x	x	x	x	
NAP, 2015	x	x	x		x		x	x	
NDC, 2015 ¹									
CC Framework Policy, 2016 ²									
CSA Strategy, 2018	x	x	x	x	x	x	x	x	x
NCCAP, 2018-2022	x	x		x	x	x	x	x	x
Livestock & Ag									
SD of Northern Kenya..., 2012	x		x	x	x	x		x	
Draft Livestock Policy, 2019	x	x	x	x	x	x	x		
Development									
Green Economy, 2016-2030	x				x				
MTP III, 2018-2022	x	x	x			x	x		

¹ The only livestock reference is, the priority adaptation action to “enhance the resilience of the agriculture, livestock and fisheries value chains by promoting climate smart agriculture and livestock development.” No reference to climate or resilience. One objective does include the “socially equitable and environmentally sustainable allocation and use of land.”

² No specific adaptation strategies for the livestock sector but references implementing adaptation actions under the NAP and general adaptation strategies include “sustainable utilization of natural resources.”

Land & Environment									
Land Policy, 2009 ³									
Environment Policy, 2013		x		x	x				
Spatial Plan, 2015-2045		x		x	x	x	x		

Mitigation synergies, conflicts and gaps

Mitigation strategies in the livestock sector are not highly prioritised in Kenya's policy. The NCCAP and CSA Strategy/Implementation Framework most robustly address mitigation options, followed by the NCCRS. Kenya's NDC recognises that 75 percent of the country's GHG emissions come from land use, land use change, and forestry (LULUCF) and the agriculture sector. The related mitigation strategies in the NDC are climate smart agriculture (in line with the national CSA framework), increasing tree cover to 10 percent, and reduce reliance on wood fuel. There is not an NDC target amount of emissions reduction from the agriculture or livestock sectors. Livestock are only explicitly referenced in the NDC in adaptation strategies.

In general, policies lack emphasis and detail on livestock mitigation options which could lead to growing sector emissions. The Draft Livestock Policy, 2019, for example, puts in place strategies to promote livestock products but is weak on mitigation and does not overtly consider the likely increase in livestock emissions that would accompany sector growth. The Draft Livestock Policy does make one reference to attracting investments in climate-smart agricultural practices along the product value chains.

Kenya's Climate Change Framework Policy, 2016, states that the agricultural sector is a substantial contributor of GHGs emissions mainly from "livestock methane emissions and land-use change." The policy goes on to say that the agricultural sector can reduce GHG emissions through agroforestry, improved pasture and rangeland management, conservation agriculture, efficient dairy production systems, and improved manure management.

The NCCAP expects to reduce GHG emissions by 2.61 MtCO₂e by 2022 through Kenya's efforts toward agroforestry, minimum tillage systems, manure management, and efficiency in livestock management. The CSA Strategy/Implementation Framework, 2018-2027, notes that enteric fermentation accounts for the highest proportion of agricultural emissions and calls for developing agricultural sector Nationally Appropriate Mitigation Actions (NAMAs). The country is developing its first agriculture sector NAMA designed to increase productivity and reduce emissions intensities in the dairy sector by at least 30 percent (CGIAR, n.d.). The impact of NAMA activities on GHG emissions will be quantified using the FAO and ILRI smallholder dairy methodology (FAO and ILRI, 2016).

A number of policies call for finding synergies in adaptation and mitigation activities, most commonly referencing sustainable land management and reforestation, but these calls are not well-detailed outside of the CSA Strategy/Implementation Framework. Reforestation is also often cited solely as a mitigation strategy and Kenya has a goal of increasing forest cover to 10 percent of land area. The NCCAP specifically references increasing forest cover in rangelands. Agroforestry is often cited as a mitigation measure in the agricultural sector, which will have relevance to some but not all of the livestock sector.

Coherence among mitigation actions

Specific calls for mitigation strategies are summarised in Table 7. Additionally, the CSA Strategy/Implementation Framework called for reducing the use of fire in rangeland management. In addition to strategies summarised here, climate policies in particular call for broader capacity building, research, and planning to support overall low carbon development.

Table 7. Policy mitigation strategies: Kenya summary

Policy	Mitigation strategies indicated, Kenya							
	SLM/ Rangeland Management	Low emissions technologies (little detail)	CSA	Manure management, biogas	MRV for agriculture	Efficiency in livestock/dairy management	Forest restoration in rangelands/ ASALS	Formulation of feeds and feed additives
Climate								
NCCRS, 2010	x	x		x				
NAP, 2015			x					
NDC, 2015	x		x					
CC Framework Policy, 2016	x			x		x		
CSA Strategy, 2018	x	x	x	x	x	x		x
NCCAP, 2018- 2022	x	x	x	x	x	x	x	
Livestock & Ag								
SD Northern Kenya, 2012 ⁴								
Draft Livestock Policy, 2019 ⁵		x	x					

⁴ Includes a strategy to: “Explore opportunities and develop appropriate mechanisms through which communities can benefit from bio-carbon initiatives.”

⁵ Includes the policy statement: “The government will develop capacities and technologies to enhance adaptation and mitigation to effects of climate change.”

Policy	Mitigation strategies indicated, Kenya							
	SLM/ Rangeland Management	Low emissions technologies (little detail)	CSA	Manure management, biogas	MRV for agriculture	Efficiency in livestock/dairy management	Forest restoration in rangelands/ ASALS	Formulation of feeds and feed additives
Development								
Green Economy, 2016-2030			x					
MTP III, 2018- 2022			x		x			
Land & Environment								
Land Policy, 2009 ⁶								
Environment Policy, 2013	x							
Spatial Plan, 2015-2045	x							

⁶ No references to climate or mitigation action.

Enabling and disabling conditions

Policies reviewed often, although not always, consider the enabling and disabling conditions that might influence policy outcomes. Policies often cite other policies and their initiatives as enabling (and sometime disabling) conditions. The NCCAP and CSA Strategy/Implementation Framework, for example, each detail how the national policy context supports climate action. The Draft Livestock Policy notes the negative impact on sector performance of more than 17 legislations governing the livestock sector most of which have not been updated to conform to the current realities. Policies also consistently describe climate change impacts as a challenge to policy goals including drought, declining water availability, floods, and extreme weather as well as associated challenges such as resource-based conflict.

The second NCCAP, 2018-2020, describes the progress on the first NCCAP that enables ongoing action. This progress includes the Ending Drought Emergencies strategy, the establishment of the National Drought Emergency Fund, and efforts to increase water availability and improve the resilience of water towers. Actions by development partners during the first NCCAP included irrigation projects, enhancing the climate resilience of pastoralists, sustainable land management, improving access to climate information, providing loans for smallholder farmers to invest in resources to increase climate resilience, and establishing agriculture insurance schemes. Many county governments integrated climate change in their 2013 County Integrated Development Plans, acknowledging that climate change poses threats to sustainable development. The Adaptation Fund supported the “Integrated Programme to Build Resilience to Climate Change and Adaptive Capacity of Vulnerable Communities in Kenya” which focused on food security, water management, coastal ecosystem management, and environmental management.

In terms of the first NCCAP mitigation efforts, these focused on electricity and transportation, however, some progress was made by the Ministry of Environment and Forests and the Kenya Forestry Service in reforestation and REDD+ actions. Kenya registered 16 Clean Development Mechanism projects including hosting the Kasigau Wildlife Corridor REDD project, the first activity to issue voluntary forestry carbon credits, and the Kenya Agriculture Carbon project.

More broadly, Kenya’s drive to align its sectoral policies with its development policy (Vision 2030), and development policy with the SDGs lead to overall resilience building that supports

climate action. Additionally, by actively developing climate policy and governance structures, Kenya has accessed climate funding from Global Environment Facility, Green Climate Fund, and Adaptation Fund. Conversely, limited budgets and governance capacity hinder policy advancement. There are also concerns that national climate action efforts have followed ministerial silos without adequate cross-ministerial coordination (CIFOR 2016).

Transboundary impacts

Kenya has extensive and porous borders with its neighbours and cross border animal movement for grazing and trade is common. There is generally weak disease control across international borders. Strategies across policy areas to improve disease control could have positive impacts on disease occurrence in the region although could potentially limit livestock movements important for climate resilience and livelihoods.

In terms of water resources, an estimated 8,400 million m³/year leaves the country to Uganda (through Lake Victoria) and 500 million m³/year flows to Somalia (through Ewaso Ng'iro river) (FAO 2015). Dramatic changes in water use and storage in these water catchments would have transboundary implications. Livestock strategies alone are unlikely to lead to substantial changes in water use.

Policy integration

As mentioned previously, there is remarkable consideration of climate impacts and action across policy areas, although less attention to mitigation than adaptation. Of the policies reviewed, only the Land Policy, 2009, does not mention climate change although it does reference putting in place an enabling environment for agriculture and livestock development. This section examines each policy (broken out by policy area) for integration of livestock sector climate change adaptation and mitigation and alignment with the SDGs and national development goals. Policies were scored for extent of integration of livestock sector adaptation and mitigation (Table 8). Higher scores designate more dedicated and detailed climate related strategies for the livestock sector. The analysis also examines the key actors in policy development as described in the policy. Where external actors were identified, these are included in brackets.

Table 8. Kenya policy integration of livestock sector adaptation and mitigation summary

Kenya	Livestock Adaptation score	Livestock Mitigation score
Climate Policies		
Climate Average	2.5	2
National Climate Change Response Strategy, 2010	3	2
NDC, 2015	2	1
National Adaptation Plan, 2015-2030	3	1
National Climate Change Framework Policy, 2016	1	2
Climate Smart Agriculture Strategy/Implementation Framework, 2018-2027	3	3
National Climate Change Action Plan, 2018-2022	3	3
Livestock & Agriculture Policies		
Livestock & Agriculture Average	3	1
National Policy for the SD of Northern Kenya ..., 2012	3	1
Draft National Livestock Policy, 2019	3	1
Development Policies		
Development Average	2	1
Green Economy Strategy and Implementation Plan, 2016-2030	1	1
Medium Term Plan (MTP III) 2018-2022 (Vision 2030)	3	1
Land & Environment Policies		
Land & Environment Average	1.67	0.67
National Land Policy, 2009	0	0
National Environment Policy, 2013	2	1
National Spatial Plan, 2015-2045	3	1

Climate policy

Starting with its first national climate change policy, National Climate Change Response Strategy (NCCRS), 2010, Kenya's climate policies have been well aligned with international development goals (MDGs then SDGs) and the country's development goals as articulated in the Medium-Term Plans for Vision 2030. Climate policies prioritise adaptation, but most include references to mitigation. Beginning with the NCCRS, climate policy has given significant attention to the livestock sector (apart from Climate Change Framework Policy, 2016, which is an institutionally focused policy, and the Green Economy Strategy and Implementation Plan). NCCRS policy development was participatory and consultative with

diverse stakeholders including representatives from the private and public sector and development partners (Nyangena, et al., 2017). The NCCRS includes suggested budgets and plans for line ministries with about USD 100 million per year for agriculture sector adaptation and mitigation activities. Climate policy development in Kenya is fairly inclusive and transparent and agricultural entities in particular are inclined toward evidence-based strategies (Nyangena, et al., 2017).

The National Climate Change Action Plan (NCCAP), 2018-2022, includes priority actions for climate finance and resource mobilisation and notes the entities responsible for each of its strategic objectives. For the food and nutrition security strategic objective, inclusive of the livestock sector, entities include the Ministry of Agriculture and Irrigation, Ministry of Water and Sanitation, Kenya Agriculture and Livestock Research Organisation (KALRO), ILRI, county governments, and pastoralist organisations.

Table 9. Kenya climate policy summary

Kenya Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
National Climate Change Response Strategy, 2010	To strengthen nationwide focused actions towards adapting to and mitigating against a changing climate by ensuring commitment and engagement of all stakeholders	Support global climate negotiations; vulnerability assessment; adaptation and mitigation options; an enabling policy, legal, and institutional framework; and action, resource mobilisation, and M&E plans	(Includes livestock adaptation and mitigation measures but not objective)	Livestock Sector: Adaptation 3 Mitigation 2 Aligned with MDGs and Vision 2030	Ministry of Environment and Mineral Resources [Danida/Sida Environmental Programme Support; also UNDP, UNEP, IDRC, and IGAD]	Internal and external sources; identified options include: Clean Development Mechanism; REDD; Nordic Climate Facility
NDC, 2015	To achieve a low carbon, climate resilient development pathway	<u>Mitigation</u> : To reduce GHG emissions by 30% by 2030; <u>Adaptation</u> : to enhance resilience to climate change towards the attainment of Vision 2030	Climate smart agriculture is listed as a mitigation activity; climate smart agriculture and livestock development are listed as adaptation activities	Livestock Sector: Adaptation 2 Mitigation 1 Aligned with Vision 2030, NCCAP, and NAP. Reference to National Climate Smart Agriculture Framework	Ministry of Environment and Natural Resources [UNDP]	Domestic and international finance, investment, technology development and transfer, and capacity-building

Kenya Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
NAP, 2016	To consolidate 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	Enhance climate resilience towards the attainment of Vision 2030	Enhance the resilience of the livestock value chain	Livestock Sector: Adaptation 3 Mitigation 1 Aligned with SDGs, Paris Agreement, and Vision 2030	Ministry of Environment and Natural Resources [DFID STARCK+ program, unnamed development partners]	Government, development partners, and private sector; financing is frequently identified as a gap
Climate Change Framework Policy, 2016	To enhance adaptive capacity and resilience to climate change and promote low carbon development for the sustainable development of Kenya	Establish and maintain an institutional framework to mainstream climate change responses across relevant sectors and into integrated planning, budgeting, decision-making, and more	N/A	Livestock Sector: Adaptation 1 Mitigation 2 Aligned with Vision 2030, NCCRS, and NCCAP	Ministry of Environment and Natural Resources, State Department of Environment	Implemented through NCCAPs with funding from national and county governments; mobilise climate finance from internal and external sources, attract and leverage PPPs

Kenya Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Climate Smart Agriculture Strategy/ Implementation Framework, 2018-2027	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	(i) Facilitate a coordinated, coherent and cooperative governance of climate resilience and low carbon growth in agriculture, (ii) mainstream CSA (iii) reduce vulnerability of agriculture systems (iv) strengthen communication on CSA extension	Same as climate objectives but with livestock specific strategies	Livestock Sector: Adaptation 3 Mitigation 3 Aligned with SDGs, Vision 2030, Paris Agreement, NAP, NCCAP, and national agriculture policy	Ministry of Agriculture, Livestock, and Fisheries; [World Bank, FAO, and UNDP; implementation framework supported by NEPAD, COMESA, EAC, CCAFS, DFID; International Climate Initiative (IKI) (BMUB) NAP-Ag program]	National and county governments; aims to mobilise technical and financial support from development partners and civil society and direct financing and investments by the private sector through PPPs
National Climate Change Action Plan, 2018-2022	To further Kenya's sustainable development by providing mechanisms and measures to achieve low carbon climate resilient development in a manner that prioritises adaptation	Seven priority areas: DRM; food and nutrition security; water; forestry, wildlife, and tourism; health, sanitation, and human settlements; manufacturing; and energy and transport	Increase productivity in the livestock sector through implementation of priority climate-smart actions	Livestock Sector: Adaptation 3 Mitigation 3 Aligned with SDGs, Vision 2030, Big Four, and NDC	Ministry of Environment and Forestry-led NCCAP Task Force [External task force participation: WWF-Kenya]	International climate finance, development partners, the private sector, and national and county government budgets

Livestock and agricultural policy

With recognition of existing and future climate impacts on agriculture, Kenya's livestock and agriculture policies, are well aligned with SDGs and national development goals. The Draft Livestock Policy, 2019, and the National Development of Northern Kenya and Arid Lands Policy, 2012 are strong on adaptation and strategies to support overall resilience but fairly weak on detailing mitigation strategies. The 2008-2011 drought heavily impacted the livestock sector and led directly to the development of the National Development of Northern Kenya and Arid Lands Policy, 2012, and has influenced subsequent climate and agricultural policy.

Table 10. Kenya livestock and agriculture policy summary

Kenya Livestock Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
National Development of Northern Kenya and Arid Lands Policy, 2012	To facilitate and fast-track sustainable development in Northern Kenya and other arid lands by increasing investment in the region and by ensuring that the use of those resources is fully reconciled with the realities of people's lives	To strengthen the climate resilience of communities in the ASALs and ensure sustainable livelihoods	No specific livestock objective	Livestock Sector: Adaptation 3 Mitigation 1 Aligned with Vision 2030 and the African Union Policy Framework for Pastoralism in Africa; reference to MDGs	Ministry of State for Development of Northern Kenya and other Arid Lands	Government, development partners, private sector, and civil society organisations
Draft National Livestock Policy 2019	To contribute to food and nutrition security and improved livelihoods while safeguarding the environment	Improve management of livestock, feed and rangeland resources while promoting social inclusion and environmental resilience	Improve management of livestock, feed and rangeland; Promote animal health and food safety; Promote investment in agribusiness, value addition and product development; Support livestock research and extension services; etc.	Livestock Sector: Adaptation 3 Mitigation 1 Aligned with SDGs, Vision 2030, Big Four Agenda, and national agricultural sector development strategies.	Ministry of Agriculture, Livestock, Fisheries and Irrigation	N/A

Development policy

Kenya's Vision 2030 as implemented through five-year Medium-Term Plans is well-aligned with the SDGs and Africa's Agenda 2063. The third Medium-Term Plan (MTP III), 2018-2022, specifies that the policy focus is on adaptation. The policy well-integrates adaptation in the livestock sector but includes no livestock mitigation strategies. The Green Economy Strategy and Implementation Plan, 2016-2030, references the SDGs and Kenya's climate policies but lacks livestock related objectives and strategies for adaptation or mitigation.

Table 11. Kenya development policy summary

Kenya Development Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Green Economy Strategy and Implementation Plan, 2016-2030	To enable Kenya to attain a higher economic growth rate consistent with the Vision 2030, which firmly embeds the principles of sustainable development in the overall national growth strategy	Enhance disaster risk reduction and mainstream DRR and climate change into sectoral development policies	Improved food security and nutrition. (Little reference to livestock.)	Livestock Sector: Adaptation 1 Mitigation 1 Aligned with SDGs, NCCAP, NAP, and National Climate Change Act	Ministry of Environment and Natural Resources; inter-agency steering committee	MTP III budget process; other tools: concessional grants and loans; PPPs, international sources; and significant private sector investments through appropriate tools and fiscal policy reforms.
Vision 2030 Third Medium Term Plan, 2018-2022	Advancing socio-economic development through the Big Four: 1) enhancing manufacturing; 2) affordable housing; 3) Food and Nutrition Security; and 4) Universal Health Coverage	Promote low carbon climate resilient and green growth development through strengthening climate change governance... and implementing Green Economy Strategy and NCCAP	Enhance food and nutrition security through increased output and agricultural processing; address the twin challenges of climate change and drought	Livestock Sector: Adaptation 3 Mitigation 1 Explicitly integrates each SDG in the plan and aligns with Africa's Agenda 2063.	National Treasury and Planning	Government and development partners including through tax reforms and PPPs

Land and environmental policy

The National Land Policy, 2009, makes no reference to climate change, but does explicitly recognise pastoralists. The policy states, “Pastoralism has survived as a livelihood and land use system despite changes in life styles and technological advancements. This tenacity of pastoralism testifies to its appropriateness as a production system.” It goes on to detail strategies to secure pastoralist livelihoods and importantly reasserts community ownership and customary land rights, retracting a previous focus on converting customary tenure into individual ownership.

The National Environment Policy, 2013, includes policy statements related to strengthening capacity for integrating climate change considerations in national and county institutions and the need to “develop an environment-friendly livestock policy that takes cognisance of livestock mobility and communal management of natural resources.” The policy offers some strategies for livestock sector adaptation but none for mitigation.

The National Spatial Plan, 2015-2045, aims to encourage the transformation from traditional farming and livestock keeping methods to modern practices but does not reference how modernisation relates to resilience and agricultural emissions. The Plan also promotes intensifying land use and expanding the acreage of land under irrigation, strategies which could have negative impacts on extensive livestock production. The Plan does, however, aim to safeguard high potential agricultural land by setting urban growth limits, diverting urbanisation from the high potential areas, and regulating the subdivision of this land. In the wetter areas of Kenya (central west, south west), the plan aims to promote large-scale commercial production which could have implications for smallholders. The Plan takes a cluster development strategy and aims to concentrate livestock industries in the ASAL areas of Isiolo, Garissa, Moyale, Mandera, Taita Taveta, Tana River, Narok, Kajiado, Kwale, Kilifi, Samburu, Turkana and West Pokot. The only specific reference to climate change mitigation is briefly in “appropriate rangeland management.”

Table 12. Kenya environmental and land policy summary

Kenya Land and Environment Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development	Finance sources
National Land Policy, 2009	To secure rights over land and provide for sustainable growth, investment and the reduction of poverty in line with the Government's overall development objectives.	N/A	To encourage a multi-sectoral approach to land use, provide social, economic and other incentives and put in place an enabling environment for investment, agriculture, livestock development...	Livestock Sector: Adaptation 0 Mitigation 0 No reference to national or international development goals	Ministry of Lands	Primarily internal revenue sources
National Environment Policy, 2013	Better quality of life for present and future generations through sustainable management and use of the environment and natural resources.	Policy statement: strengthen capacity for national and county institutions to support climate resilience, low carbon development through integrating climate change	Policy statement: Develop an environment-friendly livestock policy that takes cognisance of livestock mobility and communal management of natural resources	Livestock Sector: Adaptation 2 Mitigation 1 References MDGs and Vision 2030	Ministry of Environment, Water and Natural Resources	Government funding along with multilateral funding mechanisms, development partners, private sector and civil society organisations
National Spatial Plan, 2015-2045	To provide a national spatial structure that defines how the national space is utilised to ensure optimal and sustainable use of land	Mainstream climate change, water management, green energy generation and agriculture into the national and county planning processes	Not explicit; strategies aim to promote large-scale livestock production including through improving water access and limiting agricultural land fragmentation	Livestock Sector: Adaptation 3 Mitigation 1 References alignment with MDGs, Vision 2030, NCCRS 2010, and NCCAP	Ministry of Lands and Physical Planning	Not explicit

Ethiopia findings

The livestock sector in Ethiopia is considered one of the key sectors in the country's economic development and climate change ambitions. Ethiopia's Climate Resilient Green Economy (CRGE) Strategy (a two-part strategy released as a Green Economy Strategy in 2011 and a Climate Resilient Strategy in 2014) provides the country's climate policy foundation. The policy demonstrates Ethiopia's rather early and ambitious goals for reducing future emissions while supporting adaptation through economic development. The CRGE-Green Economy Strategy states that climate change presents the "necessity and opportunity to switch to a new, sustainable development model." Each part of the two-part policy strongly integrates the livestock sector with a range of adaptation and mitigation options. Subsequent climate policy has drawn heavily on the CRGE Strategy and is well-aligned. Among agriculture, livestock, and development policy, there are references to and fairly strong alignment with the CRGE Strategy although the Livestock Master Plan (LMP) offers very limited climate references.

Ethiopia's NAPA began in 2007 but the country's next climate policy shifted the focus to mitigation with the CRGE-Green Economy Strategy in 2011, which noted that an estimated 40 percent of Ethiopia's total GHG emission came from the livestock sector. The Green Economy Strategy references the potential to limit livestock sector emissions even as the sector grows. Following the Green Economy Strategy, Ethiopia continued to address livestock sector growth and emissions strategies across climate, livestock, and development policies. The NDC, 2015, highlights reducing emissions in the agriculture sector (in which livestock are the largest contributors).

The Livestock Investment Implementation Plan (LIP), 2015, and Multi-Sector Investment Plan (MISP) for Climate Resilient Agriculture and Forest Development, 2017, each highlight guiding livestock sector growth. The LIP acknowledges that increased livestock production will increase GHG emissions, although to a lesser extent than business as usual given investments to increase production efficiency, shift consumption towards poultry, and increase off-take rates. The LMP, 2015, does not address livestock emissions directly.

The MISP, 2017, produced through the country's engagement with the Climate Investment Funds Pilot Program for Climate Resilience, is a very detailed document. If it gains traction, it could drive investment in adaptation and mitigation in the livestock sector. It includes a strong mix of adaptation strategies as well as a less complete but still robust set of mitigation strategies. MISP activity costs are well detailed and the document includes a summary of previously internationally funded agriculture projects and potential funding sources. Interestingly, it is the only Ethiopian policy reviewed to reference (not in much detail) climate smart agriculture as a mitigation or adaptation strategy.

Ethiopia's Second Growth and Transformation Plan (GTP II), 2015-2020 seeks to maintain the country's substantial economic growth over the last decade to achieve lower middle income status by 2025. GTP II aims for annual average GDP growth of 11 percent through nine pillars including increasing agricultural (and manufacturing) productive capacity and efficiency and building a climate resilient green economy. GTP II integrates the CRGE Strategy, highlights that climate and development are strongly linked, and notes that well-designed policies can achieve growth and climate objectives. The policy calls for limiting livestock sector GHG emissions to 77 million metric tons by 2030. GTP II also contains ambitious targets to attract commercial agricultural investment on 500,000 hectares between 2015-2020; investment strategies do not explicitly reference adaptation or mitigation.

While Ethiopia's climate policies support substantial livestock adaptation and mitigation strategies, they are in somewhat in contrast to livestock policies aimed at sector growth. Policies do not necessarily contradict one another but climate policy is more ambitious in achieving emissions reduction in the livestock sector. If climate policy emissions reduction strategies are not adequately implemented, sectoral growth and the associated emissions could jeopardise the country's NDC and GTP II commitments for GHG emissions reduction in the agriculture sector.

In terms of policy implementation, Ethiopia's governance is shared between the national and nine regional governments. The country's decentralised approach extends policy oversight and involvement to regional, district (woreda), and local (kebele) levels. There are CRGE governance structures in place at national, regional, and woreda levels that are envisioned to support both mitigation and adaptation action (NAP, 2019). Ethiopia's Ministry of Agriculture is a key institution in these structures and overall CRGE implementation. While

Ethiopia has been at the forefront of climate policy for low-income countries and has established relevant governance structures, some research has shown that policy implementation is limited, particularly in rural areas (Paul and Weintal, 2018).

External actors in policy development

In terms of external actors in policy development, half of the policies reviewed list the involvement of external actors including all of the agriculture and livestock policies and half of the climate policies. It is unclear if there was external support in policies where external support is not listed. External actors include a range of bilateral and multi-lateral entities (e.g., GEF, UNDP, FAO, World Bank, African Development Bank, USAID, US Forest Service International Programs), research and programming entities (e.g., ILRI, CCAFS, IISD, GGGI), and private sector entities (e.g., Gates Foundation, YONAD Business Promotion & Consultancy PLC). Ethiopia's Multi-Sector Investment Plan (MSIP) for Climate Resilient Agriculture and Forest Development, 2017-2030, was developed through the Climate Investment Fund's Pilot Program for Climate Resilience (PPCR) supported by the World Bank and African Development Bank. See policy summary tables below for more detail.

Ethiopia climate-livestock policy opportunities for engagement summary

Strongest synergies across policies

- Ethiopia's climate (CRGE Strategy, NDC, and NAP) and development (GTP II) policies are provide strong and coherent strategies for livestock sector adaptation and mitigation.
- The Livestock Master Plan (LMP), 2015, includes remarkably brief reference to climate change but does state that its interventions were assessed according to GTP objectives including contribution to climate change mitigation and adaptation. While it does not include explicit adaptation or mitigation strategies, the LMP's detailed approach and activities for improved breeding, feeding, disease control, pasture management, and soil and water conservation could go farther in building climate resilience and limiting emissions than some dedicated, but less detailed, climate-livestock strategies. More explicit attention to climate issues in implementation could facilitate this. The Livestock Investment Implementation Plan (LIP) aims to build on the LMP by strengthening mitigation action.

Key gaps

- Across policy areas there is almost no reference to CSA. While many strategies align with a CSA approach, more explicit engagement with a CSA approach could facilitate adaptation and mitigation co-benefits and sustainable sector growth. In the absence of a CSA approach, dedicated livestock mitigation strategies such as breeding for increased productivity could inadvertently lead to adverse impacts to livestock climate resilience.
- The Draft Integrated Land Use Policy, 2019, could be a key document for facilitating livestock sector adaptation and mitigation but does not adequately integrate climate and livestock issues. There are hopes that it will be an integral part of the country's Third Growth and Transformation Plan (GTP III), 2020-2024. While the policy supports overall resilience in the livestock sector and among pastoralists and agro-pastoralists, there is no direct reference to climate impacts to livestock or adaptation or mitigation action.

Potential conflicts

- The Environment Policy, 1997, largely portrays livestock as a driver of land degradation that has resulted in lost agricultural production and diminished agricultural potential. While the current development policy, including the Draft Pastoral Development Policy, now includes a much more nuanced view of livestock, some strains of the Environment Policy view may remain. The GTP II, for example, references the livestock sector's dependence on "backward production methods." If implementation of the GTP II results in overemphasis on intensifying livestock sector production, there could be a missed opportunity to achieve livestock sector adaptation and mitigation ambitions among the pastoral systems that account for much livestock production. (See additional detail in the pastoral mobility section below.)

Adaptation synergies, conflicts and gaps

Adaptation strategies are well-aligned across policy areas in Ethiopia. GTP II, for example, is aligned with climate and livestock policy and includes numerous references to the CRGE Strategy. The CRGE, in turn, devotes extensive attention to the livestock sector. The NAP, 2019, also addresses the livestock sector and explicitly aims to add value to ongoing development efforts by incorporating responses to current and anticipated climate impacts. As far back as the Environment Policy, 1997, there are calls for a national climate vulnerability monitoring program as well as improved breeding, NRM, and water access although the

policy does not explicitly consider livestock adaptation. More recent policies and those most likely to drive adaptation action are the Multi-Sector Investment Plan (MISP) for Climate Resilient Agriculture and Forest Development (PPCR), 2017- 2030 and NAP, 2019. The NAP aims to be a continuation of the CRGE Strategy.

Livestock sector adaptation strategies address pastoral and non-pastoral systems. The policy strategies overall lean toward addressing long-term trends rather than extreme events. In contrast to Kenya, early warning systems and livestock insurance are much less prominent. These strategies are present, although not well-detailed, in climate and development policy but are not present in livestock policy. More prominent are strategies for improving natural resource management and water availability.

In terms of adaptation and mitigation synergies and conflicts, the CRGE-Green Economy Strategy, 2011, calls for breeding, feed, and health interventions to meet mitigation goals; some of these will have adaptation co-benefits but not necessarily. Breeding for increased productivity, for example, could decrease livestock climate resilience to excess heat or limited water. The LMP, 2015, does note that crossbreeding for higher milk production is not recommended for lowland pastoral and agro-pastoral systems due to feed shortages and high temperatures. The CRGE-Climate Resilience Strategy, 2014, responds to the CRGE-Green Economy Strategy noting that shifts in the livestock mix have the potential to increase or decrease climate vulnerability depending on the species chosen. The Strategy also states that efforts to increase poultry production should include appropriate housing for increasing temperatures.

Pastoral mobility

The Draft Pastoral Development Policy and Strategy, 2018, provides a holistic approach to pastoral development that has been lacking. The policy recognizes that mobility is a central feature of pastoralism and aims to provide basic social services, infrastructure, and extension services compatible with mobility. The policy aims to develop a land use and administration system and participatory rangeland land use and management planning to support natural resource management. The maintenance of pastoral lands for pastoralism (and ability to prevent encroachment) will depend on the strength of these land administration systems. The policy also states that it will support a strategy to identify pastoralists who prefer to abandon mobility and “persuade them to voluntarily settle.” These voluntary commune programs

intend to provide an alternative to pastoralists who may want to expand their livelihood base or have not been successful in mobile pastoralism. While the policy describes a detailed approach for this strategy, it does not explicitly recognize how challenging settlement programs are and their frequent failure to improve quality of live.

Beyond the Draft Pastoral Policy, the Livestock Master Plan, 2015, states that the “government and other stakeholders need to promote herd mobility as a strategy to utilise temporal and spatial variability in the availability of forage.” In contrast, the GTP II does not state any support for mobility but aims to build on GTP I to enhance “voluntary sedentary farming (crop farming) practices” among pastoralists to ensure sustainable transformation of pastoral livelihoods. A similar policy contrast is built into the Environment Policy of Ethiopia, 1997, which aims to maximise the standing biomass in the country including through “control of free range grazing” while at the same time fostering “a feeling of assured, uninterrupted and continuing access to the same land and natural resources on the part of farmers and pastoralists so as to remove the existing artificial constraints to the widespread adoption of, and investment in, sustainable land management technologies.” The MISP notes the need to improve land use planning and implementation in pastoral systems but does not more explicitly aim to promote or control mobility. Climate policy notes pastoral systems vulnerability to climate change but does not weigh in on issues of mobility.

As a component of agriculture sector growth, the national government has attracted significant investment in lowland areas but long-term leasing of community lands has been criticised for infringing on community rights to pastureland, forest resources, and seasonal water sources (USAID, 2016). Pastoral land claims, particularly in the south, have historically been poorly recognised leading to expropriation of pastoral lands for a range of uses often without adequate consultation or compensation.

Coherence among adaptation actions

Across policy areas, Ethiopia demonstrates remarkable alignment around adaptation strategies, particularly improved natural resource management, feed and grazing, water availability, and breeding. **Improving natural resource management** and pasture/rangeland productivity is a prominent strategy across all policy areas. A range of specific strategies include improving pasture and grazing management, for example, grazing rotation, soil and water conservation structures and measures, rehabilitating degraded lands, oversowing

pastures, promoting cut and carry and stall feeding, and watershed management. There are consistent calls across climate, livestock, and development policy for **improving feeding and grazing resources** as an adaptation strategy. Strategies referenced include improved feeding systems, addressing food shortage, forage development, improved pasture and rangeland productivity, changing feeding practices including feed supplementation, distributing disease resistant fodder varieties, improved feed storage facilities, and feed reserves for drought.

Increasing water availability is another prominent strategy across policy areas including implementing water harvesting technologies, soil and water conservation, targeted research and development, and irrigation development for livestock holders.

Strategies for **improved breeding**, also prominent, aim to increase livestock resilience and disease resistance including through artificial insemination and synchronisation and replacing local cattle with crossbreeds. Related to improved breeding, strategies also include herd diversification and **shifting to more climate resilient livestock species**, for example, moving from cattle to sheep, goat, and camel (e.g., CRGE-Climate Resilience Strategy, MISP, NAP).

Disease control strategies are referenced with some frequency and include strengthening capacity to address disease (e.g., NDC, CRGE-Climate Resilience Strategy), transboundary livestock disease monitoring (e.g., MISP), and increasing access to veterinary services (e.g., LMP, LIP). **Improving early warning systems** strategies in the livestock sector are consistent across climate and development policy and are addressed in the Draft Pastoral Development policy but not other livestock policies. (Although they are included in the MISP which is treated as a climate policy in this review.) The NAP includes improving early warning systems as one of 18 adaptation options and provides the most detailed strategy; the NDC also includes an early warning system strategy.

Similar to policy treatment of early warning systems, **livestock insurance** strategies are consistent only across climate and development policy and are detailed in the NDC and NAP where strengthening agriculture insurance, including livestock, is one of the 18 adaptation options. The MISP discusses the context of livestock insurance in Ethiopia noting that while it has been piloted, high costs involved in selling the products, high premiums relative to insurance benefits, and weak implementation capacity have hindered scaling up.

Enhancing extension services to increase climate resilience is addressed across climate, livestock, and development policy. Strategies are not well-detailed but generally include

expanding extension services to strengthen climate resilience and livestock productivity.

Livelihood diversification receives the most discussion in the Draft Pastoral policy and fairly superficial treatment in some climate policy and the Agriculture PIF. Increased availability and access to **climate information** are only noted in climate policies and the Draft Pastoral policy. The most detailed climate information strategy is in the MISP and involves improving agrometeorology and hydrometeorology services, spatial data and data storage, and sharing platforms including historical data analysis and projections. Additional adaptation strategies referenced include **value chain development** (NAP, GTP II), **improved poultry shelters** (CRGE-Climate Resilience Strategy), **relocating vulnerable groups** (CRGE-Climate Resilience Strategy), **CSA** (MISP), and **small-scale irrigation** (Draft Pastoral policy). Climate policies, GTP II, and the Draft Pastoral policy also call for research to support livestock adaptation.

In addition to these specific strategies (Table 13), a range of policies call for agricultural research and development and institutional strengthening to support adaptation. The CRGE-Climate Resilience Strategy provides many targets for institutional, capacity, and planning support for adaptation as well as broader steps toward resilience including research and value chain development. The MISP includes livestock research and development to address climate change as a dedicated activity package. While not specific to the livestock sector, the NAP also references arranging voluntary resettlement or migration, in addition to other social protection strategies, for vulnerable groups.

Table 13. Policy adaptation strategies: Ethiopia summary

Policy	Adaptation strategies indicated, Ethiopia									
Document	Improve NRM/ productivity	Improve livestock water availability	Improve breeding	Improve feed/ grazing	Increase climate information	Improve extension activities	Improve disease control/ veterinary access	Establish/ improve early warning systems	Livestock Insurance	Livelihood diversification/ alternative livelihoods
Climate										
NAPA, 2007	x	x						x	x	
CRGE, GE Strategy, 2011	x					x		x		
CRGE-CR Strategy, 2014	x	x	x	x	x	x	x	x	x	x
NDC, 2015	x	x	x	x			x	x	x	
MISP, 2017	x	x	x	x	x	x	x	x	x	x
NAP, 2019	x	x	x	x	x	x	x	x	x	x
Livestock/Ag										
Ag PIF, 2010- 2020 ⁷	x	x	x	x		x				x
LMP, 2015	x	x	x	x		x	x			
LIP, 2015			x	x		x	x			

⁷ The Agriculture PIF also calls for exploring livestock insurance options but not explicitly for implementing them. Its reference to livelihood diversification is for diversifying smallholder production into higher value (non-staple) crop and livestock products.

Policy	Adaptation strategies indicated, Ethiopia									
Document	Improve NRM/ productivity	Improve livestock water availability	Improve breeding	Improve feed/ grazing	Increase climate information	Improve extension activities	Improve disease control/ veterinary access	Establish/ improve early warning systems	Livestock Insurance	Livelihood diversification/ alternative livelihoods
Draft Pastoral Policy, 2018	x	x	x	x	x	x	x	x	x	x
Development										
GTP II, 2016- 2020	x	x	x	x		x	x	x	x	
Land/ Environment										
Environment Policy 1997	x	x	x							
Draft Integrated Land Use Policy, 2019 ⁸	x			x						

⁸ The policy does not reference adaptation directly but include resilience building measures.

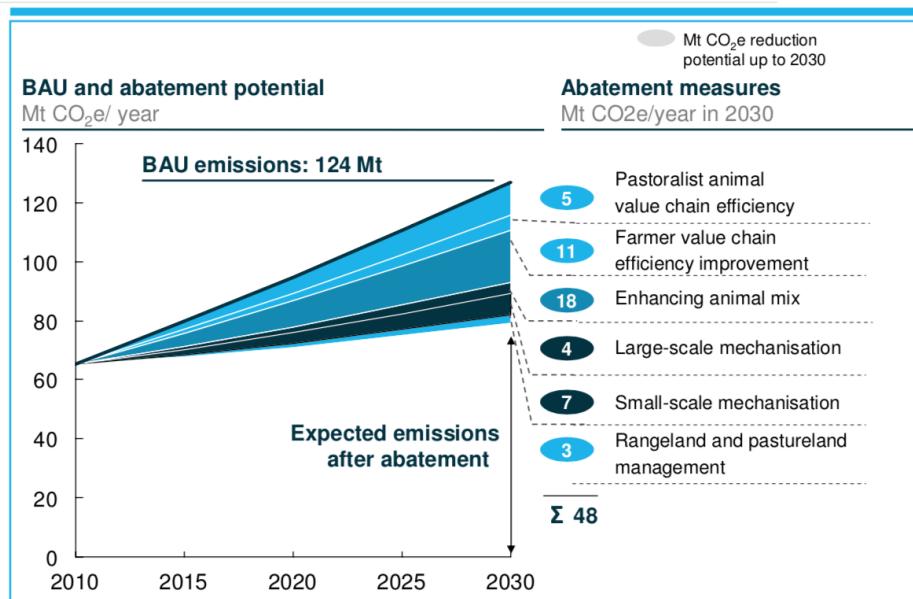
Mitigation synergies, conflicts and gaps

Key climate and livestock policy documents in Ethiopia reinforce mitigation ambition and an associated set of strategies (Table 14). The CRGE-Green Economy Strategy provides Ethiopia's most comprehensive approach to mitigation in the livestock sector and is frequently referenced in later policies. The Strategy explicitly acknowledges the significant contribution of the livestock sector to GHG emissions and projects a doubling of sector emissions by 2030 under business as usual. The Strategy outlines mitigation strategies with an abatement potential of up to 48 Mt CO₂e in 2030 (Figure 1). While less detailed in their specific strategies, the NDC and development policy (GTP II) state their alignment with the more detailed CRGE-Green Economy Strategy. This alignment includes the GTP II's echo of the CRGE call to limit livestock sector GHG emissions to 77 million metric tons by 2030. Additionally, the first of the four NDC pillars for mitigation is "improving crop and livestock production practices for greater food security and higher farmer incomes while reducing emissions."

The LMP does not detail dedicated mitigation strategies although it is highly relevant for mitigation action as it focuses on increasing productivity per livestock unit through improved feeding and rangeland management. The LMP does state an aim to contribute to climate change mitigation broadly. The LIP is dedicated to mitigation strategies for the dairy and poultry value chains. Environment and land policies are relatively weak on mitigation strategies although, notably, the Environment Policy from 1997 highlights climate mitigation as an environmental issue although there is not explicit discussion of livestock emissions or mitigation strategies.

Figure 1. Livestock GHG emissions reduction potential

Livestock – Abatement potential until 2030 is 48 Mt CO₂e per year



Source: Ethiopia CRGE Strategy 2011

Coherence among mitigation actions

The CRGE-Green Economy Strategy outlines four groups of mitigation measures for the livestock sector. These are:

1. Increase livestock production and consumption of **lower-emitting species** (enhancing animal mix) by acting on supply and demand aspects with a specific aim to increase poultry to 30 percent of meat consumption by 2030,
2. Increase **livestock value chain efficiency** through more productive breeds; improved feed, inputs, technology, and public infrastructure; and optimising age of slaughter,
3. Mechanisation to partially substitute animal draught power among farmers in the highland plains, and
4. **Rangeland and pastureland management** to increase soil carbon content and productivity through bush clearing, reseeding, paddocking, rotational grazing, improving and adopting traditional ways of managing rangelands, and water point development.

The LIP, focused on dairy and poultry, directly reinforces each of the four CRGE-Green Economy Strategy mitigation groups for livestock.

The CRGE-Green Economy Strategy also calls for establishing a **measuring, reporting, and verifying (MRV)** system for livestock-related GHG emissions and a **REDD-like mechanism** to monetise reduced emissions from livestock that could allow access to climate funds for implementation of initiatives. And the MISP, 2017, references **livestock payment for ecosystem services** (e.g., destocking, switch to poultry, etc.) and **reducing deforestation** for grazing to limit livestock sector emissions.

In addition to the CRGE-Green Economy Strategy measures, other strategies to **improve natural resource/rangeland/pasture management** for climate mitigation include rehabilitating degraded lands, avoiding deforestation, monitoring grazing, and revegetation and reforestation.

Table 14. Policy mitigation strategies: Ethiopia summary

Policy	Mitigation strategies indicated, Ethiopia								
Document	Improve NRM/rangeland management	Increase efficiency/productivity (health, breeding, feeding, etc.)	Promote agro-forestry	Shift meat consumption toward lower-emitting sources (diversity livestock mix)	Mechanise draught power	Optimise age at slaughter (sell livestock at earlier age)	Improve manure management (biogas)	Implement CSA	Establish MRV for livestock sector
Climate									
NAPA, 2007	x	x	x						
CRGE-GE Strategy, 2011	x	x	x	x	x	x	x		x
CRGE- CR Strategy, 2014 ⁹	x		x						
NDC, 2015		x							
MISP, 2017	x	x	x	x	x		x	x	
NAP, 2019 ¹⁰	x	x			x			x	

⁹ The CR Strategy refers to the GE component for mitigation measures and seeks for adaptation and mitigation co-benefits. It refers to health, feed, and breeding interventions in the context of adaptation but not mitigation.

¹⁰ The NAP presents the adaptation aspects of these strategies rather than mitigation.

Livestock & Agriculture									
Ag PIF, 2010-2020	x	x							
LMP, 2015	x	x		x					
LIP, 2015	x	x		x		x			
Draft Pastoral Policy, 2018 ¹¹									
Development									
GTP II, 2016-2020	x	x	x		x				
Land & Environment									
Environment Policy, 1997	x		x						
Draft Integrated Land Use Policy, 2019 ¹²	x								

¹¹ The Draft Pastoral Policy and Strategy contains no overall nor specific discussion of mitigation, however, some of the adaptation and resilience actions would likely have mitigation co-benefits.

¹² The policy does not reference mitigation action but does include improving rangeland management.

Enabling and disabling conditions

Ethiopia's livestock sector contributes an estimated 12 percent to total GDP and is one of the country's main exports including through informal cross border trade; pastoral livestock population is an estimated 40 percent of total livestock production (USAID, 2016).

Agriculture sectors have been key to country's economic growth and are receiving related attention (e.g., prominence in GTP II) that could facilitate livestock sector adaptation and mitigation action.

Climate policies in particular aim to raise the profile of climate action through institutional, capacity, and planning initiatives. The prominence of the CRGE Strategy, its integration of the livestock sector, and livestock and development policy alignment with the CRGE are key enabling conditions. Further, the Climate Investment Funds Pilot Programme for Climate Resilience (PPCR) in Ethiopia has focused on agriculture and forestry. The PPCR investment plan is manifest as the Multi-Sector Investment Plan (MISP) for Climate Resilient Agriculture and Forest Development, 2017-2030. The Plan strongly integrates livestock sector adaptation and mitigation and identifies specific financing sources for activities.

The policies reviewed discuss a range of enabling and disabling conditions for climate adaptation and mitigation in the livestock sector. The LMP provides detailed descriptions of challenges for implementation and strategies to overcoming them which are applicable across policy areas and adaptation and mitigation strategies. Some challenges to implementation include:

- Limited access to land for production of forage and forage seed,
- Inadequate and poor access to quality forage seed and cuttings;
- Insufficient extension and animal health services,
- Inadequate supply and poor quality control of drugs and veterinary supplies,
- Inefficient AI services,
- Low productivity of local breeds and a low number of improved genotypes, and
- Very high calf mortality.

In terms of improving enabling conditions for climate resilience in the livestock sector, the MISF provides specific recommendations including:

- Implementation of the newly developed Animal Breeding Policy should consider future climate scenarios and prioritise those characteristics that will allow higher yields under uncertain conditions and increased temperatures.
- Ensure that land use planning guidance considers strategic feedlot creation alongside irrigation for agriculture to preserve the integrity of extensive grazing systems.
- Review policies impacting livestock feed and create incentives for domestic feed production, including limiting the oilseed export, encouraging domestic grain production, and integrating livestock feed production in newly developed Agro-Industrial Park Clusters.
- Greater investments in research and development for livestock production systems in areas with a high level of vulnerability to climate change.

The Draft Pastoral Development Policy and Strategy describes that underdevelopment in pastoral areas is related to gaps in government policies and strategies, a view of pastoralism as a backward livelihood system, practices that have restricted pastoralists' mobility, and absence of relevant development plans. The policy also notes that failure to recognize customary and communal management systems has undermined them and led to natural resource degradation. Alternatively, the policy notes a range of government efforts have aimed to support pastoralists although these have not resulted in adequate development. These efforts include the right to self-administration and special support granted under the Constitution, which has led to institutional arrangements such as the Standing Committee that looks after the affairs of Pastoral Development in the House of Peoples Representatives, the Federal and Pastoral Development Affairs Ministry, and the Federal Special Support Board. Other policies have noted reluctance among pastoralists to switch to improved breeds or reduce herd size as a constraint.

Transboundary impacts

The MISP includes an activity package for transboundary disease monitoring for livestock in woredas adjacent to border areas. The objective is to increase the resilience of Ethiopia's livestock population by monitoring and preventing the spread of disease by livestock movements across the country's border. The document notes that this kind of monitoring has

not been widely implemented and is needed to address the shifting pest and disease range and occurrence related to climate trends. As is the case with Kenya, Ethiopia has extensive and porous borders and cross border animal movement is common. Improved transboundary disease control is key yet efforts should consider the importance of livestock movement across borders for climate resilience and livelihoods.

Surface water flowing out of Ethiopia is estimated 96,500 million m³/year (FAO, 2016). The majority of this flows into Sudan through the Blue Nile and its tributaries, the Atbara river, and the Setit-Tekeze river. Lesser amounts flow into South Sudan (the Baro and Akobo rivers forming the Sobat river), Somalia (Genale and Dawa rivers forming the Juba river and the Shebelle river), and Eritrea. Substantial irrigation development, unlikely specifically for the livestock sector, or other changes in water use would have transboundary implications in these river systems.

Policy integration

Ethiopia's climate and development policies are strong and coherent on livestock sector adaptation and mitigation measures. There is particular coherence among the country's CRGE Strategy, development policy (GTP II), NDC, and NAP. Livestock and agriculture policies are weaker on attention to climate- livestock issues although the LIP sets out an approach for mitigation in the dairy and poultry value chains. The Draft Integrated Land Use Policy could be a key document for facilitating livestock sector adaptation and mitigation but does not adequately integrate climate and livestock issues.

This section examines each policy area for integration of livestock sector climate change adaptation and mitigation and alignment with the SDGs and national development goals. Policies were scored for extent of integration of livestock sector adaptation and mitigation (Table 15). Higher scores designate more dedicated and detailed climate related strategies for the livestock sector. The analysis also examined the key actors in policy development as described in the policy. Where external actors were identified, these are included in brackets.

Table 15. Ethiopia policy integration of livestock sector adaptation and mitigation summary

Ethiopia	Livestock Adaptation score	Livestock Mitigation score
Climate Policy		
Climate Average	2.5	2
NAPA, 2007	2	2
Climate Resilient Green Economy Strategy, Green Economy Strategy, 2011	1	3
Climate Resilient Green Economy (CRGE), Climate Resilience Strategy, 2014	3	2
NDC, 2015	3	1
Multi-Sector Investment Plan (MISP) for Climate Resilient Agriculture and Forest Development (PPCR), 2017- 2030	3	3
NAP (Climate Resilient Green Economy Strategy), 2019	3	1
Livestock & Agriculture Policy		
Livestock & Agriculture Policy Average	1	1.33
Agricultural Sector Policy and Investment Framework (PIF), 2010-2020	1	1
Livestock Master Plan, 2015	1	1
Livestock Investment Implementation Plan, 2015-2030	1	2
Development Policy		
Development Average	3	3
Growth and Transformation Plan II (GTP II), 2016-2020	3	3
Land & Environment Policy		
Land & Environment Average	1	1
Environment Policy, 1997	1	1
Draft Integrated Land Use Policy, 2019	1	1

Climate policy

The foundation of Ethiopia's climate policy is the two-part Climate Resilient Green Economy (CRGE) Strategy released in 2011 and 2014. The country's NAP, released in 2019, builds directly on the CRGE Strategy and development (GTP II) policy. The CRGE Strategy and NAP are strong on integrating the livestock sector. Climate and development policies recognise the nationally significant GHG emissions contribution of the livestock sector and the importance of the sector for incomes and livelihoods. The CRGE-Green Economy Strategy focuses on improving the efficiency of beef production and shifting meat consumption from beef to poultry. The CRGE-Climate Resilience Strategy is exclusively focused on the agriculture and forestry sectors "due to their importance to national income

and livelihoods” and the NAP strongly addresses agriculture, NRM, and water along with other sectors. The CRGE-Climate Resilience Strategy presents 41 program options for agriculture and forestry while the NAP is organised around 18 adaptation option across sectors. The NDC clearly outlines the role of the livestock sector in climate change and prioritises mitigation and adaptation options in the livestock sector. Interestingly, the country’s 2007 NAPA is rather weak on livestock sector strategies.

The Multi-Sector Investment Plan (MISP) for Climate Resilient Agriculture and Forest Development, provides the most detailed livestock adaptation and mitigation strategies of Ethiopia’s climate policies, including activity costing and funding sources. It is well aligned with international and national development goals. Led by the Ministry of Finance and Economic Development, it received extensive external support from PPCR.

Table 16. Ethiopia climate policy summary

Ethiopia Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
NAPA, 2007	To identify immediate and urgent adaptation activities that address current and anticipated adverse effects of climate change including extreme climate events	Same as overall	No overall livestock objective	Livestock Sector: Adaptation 2 Mitigation 2 Aligned with Ethiopia's development goals at the time for poverty, environment, agriculture, water, etc.	National Meteorological Agency with a steering committee [GEF, UNDP]	None identified
Climate Resilient Green Economy (CRGE), Green Economy Strategy, 2011	Achieve middle-income status by 2025 in a climate-resilient green economy	Ensure abatement and avoidance of future emissions, i.e., transition to a green economy; Improving resilience to climate change.	Improving crop and livestock production practices for higher food security and farmer income while reducing emissions (1 of 4 policy pillars); efficiency improvements to the livestock value chain (1 of 4 fast-tracked initiatives)	Livestock Sector: Adaptation 1 Mitigation 3 Alignment with GTP	Prime Minister's Office, the Environmental Protection Authority, and the Ethiopian Development Research Institute	Government; market-based activity; Bi-/multilateral grants or pay-for-performance deals (i.e., payments linked to verified GHG abatement); Trading schemes or offset markets, e.g., emission Clean Development Mechanisms (CDMs)

Ethiopia Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Climate Resilient Green Economy (CRGE), Climate Resilience Strategy, 2014	To follow an economic growth path in agriculture that is resilient to current weather variability and future climate change	To identify ways to build climate resilience; To map the steps necessary to build climate resilience. Prioritises options with low-carbon and climate resilient benefits.	The strategy has seven prioritised measures for livestock in addition to other cross-cutting adaptation measures.	Livestock Sector: Adaptation 3 Mitigation 2 Alignment with MDGs, GTP	Ministry of Environment and Forest (MEF) with support from the Prime Minister's Office and the Ethiopian Development Research Institute	National and subnational government, revenue generation, private sector, climate finance and development partners.
NDC, 2015	To limit GHG emissions in 2030 to 145 Mt CO ₂ e or lower (64% reduction from the BAU in 2030). To undertake adaptation initiatives to reduce vulnerability based on CRGE Strategy.	Same as overall	Improving crop and livestock production practices for greater food security and higher farmer incomes while reducing emissions (1 of 4 pillars); reduce agriculture sector emissions by 90 Mt CO ₂ e by 2030 compared to BAU.	Livestock Sector: Adaptation 3 Mitigation 1 Aligned with CRGE Strategy and GTP II	Unknown	National budgets; seeking international climate finance

Ethiopia Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Multi-Sector Investment Plan (MSIP) for Climate Resilient Agriculture and Forest Development, 2017-2030	To help Ethiopia to systematically convene, coordinate and complement financing for resilience objectives in the forest, agriculture, livestock, water and energy sectors from a variety of existing and future sources	Enhanced climate responsive and climate resilient development planning; investment opportunities; and government capacity (7.6% of proposed investment is in livestock)	Ensuring climate resilient livestock management and livelihoods (this is 1 of 5 policy “activity groups”)	Livestock Sector: Adaptation 3 Mitigation 3 aligned with CRGE Strategy, GTP II, Climate Resilience Strategy for Agriculture and Forest, NDC, NAPA, Agriculture Policy Investment Framework, Ethiopia Strategic Investment Framework for SLM	Ministry of Finance and Economic Development (with MEFCC, MoANR, MoLF, & MoWIE) [World Bank, African Development Bank, Climate Investment Fund's (CIF) Pilot Program for Climate Resilience (PPCR)]	For livestock sector-- Multilateral: Adaptation Fund, African Development Bank, Climate Investment Funds - PPCR, FAO, Green Climate Fund, IFAD, UNDP, WB Bilateral: Canada DFATD, Finland, Kreditanstalt für Wiederaufbau (KfW), Switzerland, USAID
NAP, 2019	To create climate change impact resilient development for Ethiopia and its people	To reduce climate change vulnerability by building adaptive capacity and resilience to enhance economic development; To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programs and activities, etc.	Enhancing food security by improving agricultural productivity in a climate-smart manner; Strengthening sustainable natural resource management; Strengthening drought, livestock & crop mechanisms; Etc.	Livestock Sector: Adaptation 3 Mitigation 1 Alignment with SDGs, UNFCCC agreements, GTP II, CRGE, CRSAF, NDC, and sectoral adaptation plans	Ministry of Environment, Forest and Climate Change; inter-ministerial steering body [Technical support from USAID-Ethiopia, United States Forest Service International Programs and IISD]	Use the CRGE Facility to mobilise, access and combine domestic and international (World Bank, UNFCCC, Green Climate Fund-GCF, the UNDP, GEF, etc.), public, private, CSO, and community sources of finance

Livestock and agricultural policy

Ethiopia's Livestock Master Plan (LMP), 2015 is a contribution to the country's national development plan. The plan aims to address the previous absence of clear roadmaps to develop the livestock sector, which have persistently hindered Ethiopia's aim to transform its agriculture sector. The LMP sets out investment interventions to improve productivity and total production in the key livestock value chains for poultry, red meat and milk, and crossbred dairy cows. The LMP aims to grow red meat and milk production from 1.28 to 1.93 million tonnes between 2015 and 2020, in addition to poultry growth. The LMP notes that the annual growth rate in cattle numbers could be reduced but only if projected productivity increases are realised and farmers are incentivised to reduce herds. This growth in production has clear implications for increasing livestock sector GHG emissions.

The Livestock Investment Implementation Plan (LIP), 2015-2030, was developed to address the lack of GHG emissions analysis and mitigation strategies in the LMP. It targets the dairy and poultry value chains due to their importance for income, food security, GDP, and potential for lower GHG emissions. It aims to dramatically increase poultry and dairy production leading to an increase in cow milk production by 148% in 2030 (corresponding increase in GHG emissions of 26%). The increase in poultry production is aimed at replacing some of the higher emissions red meat consumption. The plan notes that implementation will result in an increase in GHG emissions but a lower increase than business as usual due to improved productivity per unit. The LIP does not explicitly address climate impacts or adaptation strategies although measures to improve animal breeding, feed and health will likely contribute to overall resilience. There is no consideration, however, of the climate resilience of breeds selected for increased milk production.

Ethiopia's Draft Pastoral Development Policy and Strategy, 2018, demonstrates a significant effort to support pastoralists and their climate resilience although there is no discussion of mitigation. The policy aims to redress the gaps of past policies that have resulted in uneven development, negative attitudes about pastoralism, and undermined pastoralism as a livelihood strategy. The policies two pillars focus on 1) improving pastoralists livelihood and incomes through a range of targeted strategies (e.g., improving, animal productivity, rangeland and water resources, and competitive advantage) and 2) supporting pastoralists

voluntary settlement in appropriate areas to facilitate opportunities for commercial activities and livelihood diversification.

The Agricultural Sector Policy and Investment Framework (PIF), 2010-2020, aims to sustainably increase livestock production and productivity. It contains an ambitious (but not well detailed) crosscutting theme of “improving the adaptability of the agricultural sector to climate change and achieving national carbon neutrality by 2020.”

Table 17. Ethiopia livestock and agriculture policy summary

Ethiopia Livestock/Agriculture Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Agricultural Sector Policy and Investment Framework (PIF), 2010-2020	To contribute to Ethiopia's achievement of middle income status by 2020; to sustainably increase rural incomes and national food security	PIF theme: Improving the adaptability of the agricultural sector to climate change and achieving national carbon neutrality by 2020.	SO1: To achieve a sustainable increase in agricultural productivity and production (including livestock).	Livestock Sector: Adaptation 1 Mitigation 1 Aligned with GTP, Comprehensive Africa Agriculture Development Program	Ministry of Agriculture and Rural Development [UNDP, FAO]	National government and external sources
Livestock Master Plan, 2015	Support the GTP II objectives for livestock: Reduce poverty; Achieve better food security; Contribute to national income growth; Contribute to exports and foreign exchange earnings; and Contribute to climate mitigation and adaptation.	Support the GTP II objective: Contribute to climate mitigation and adaptation	Improve value chains for both commercial and smallholder systems for: poultry, crossbred dairy cow, and red meat-milk (from indigenous cattle, sheep, goats, and camels)	Livestock Sector: Adaptation 1 Mitigation 1 Directly supports GTP II; no direct reference to strategies for adaptation or mitigation	Ministry of Agriculture, Livestock Resources Development Sector [ILRI, MARIL-Ethiopia; funded by the Gates Foundation]	National budgets, development partners, NGOs, CSOs, private sector

Ethiopia Livestock/Agriculture Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Livestock Investment Implementation Plan (LIP), 2015-2030	To improve the poultry and dairy value chains to increase income, food security, and GDP contribution and limit GHG emissions	Limit the growth of GHG emissions in the poultry and dairy value chains.	To increase the share of chicken meat consumption to total meat consumption from 5 to 30% by 2030; to raise total cattle milk production from 662 million litres in 2015 to 9,619 by 2030	Livestock Sector: Adaptation 1 Mitigation 2 Aligned with GTP, LMP, and CRGE Strategy (although acknowledges increasing livestock emissions)	Ministry of Agriculture -CRGE unit [Global Green Growth Institute (GGGI), YONAD Business Promotion & Consultancy PLC]	National government, private investors, PPPs,
Draft Pastoral Development Policy and Strategy	To realize improved and sustainable livelihoods for people in pastoral areas through integrated development that is centered on the animal resources, local knowledge and other reliable endowments	N/A	To improve the livelihood standard and income of mobile pastoralists through increasing animal production and productivity	Livestock Sector: Adaptation 3 Mitigation 0 No reference to SDGs or GTP although strategies for climate adaptation are aligned	Ministry Peace, Board member ministries, other institutions, and professional experts; Core Advisory Team-government and development partners [USAID and unnamed development partners]	Reference to government and non-government budgets

Development policy

GTP II, 2016-2020, highlights that climate and development are strongly linked and that well-designed policies can achieve growth and climate objectives. Additionally, it notes that if climate change is not addressed, growth itself is at risk. The CRGE Strategy is well integrated into GTP II. Continuing along the path of GTP I, GTP II highlights agriculture as a main driver of economic growth and development. It aims to promote livestock development, among other agricultural areas, through support to farmers and pastoralists in order to increase productivity and export potential. The policy notes that livestock sector improvements under GTP I were not sufficient and GTP II aims to transform the sector.

Table 18. Ethiopia development policy summary

Ethiopia Development Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Second Growth and Transformation Plan (GTP II), 2016-2020	To reach the level of lower middle-income countries where democracy, good governance and social justice are maintained through people's participation.	Build a climate resilient green economy	Improve agricultural productivity, quality, and competitiveness to speed up structural transformation; to limit livestock sector GHG emissions to 77 million metric tons by 2030	Livestock Sector: Adaptation 3 Mitigation 3 Aligned with SDGs, Common African Position (CAP) on Post- 2015 Development Agenda, Agenda 2063 of Africa, Addis Ababa Action Agenda, and CRGE Strategy	National Planning Commission	Domestic revenue, domestic borrowing, external grants, foreign loans,

Land and environmental policy

Ethiopia's land policy derives from the 1995 Constitution (all urban and rural land is the property of the state and Ethiopian people) and a range of land-related policies. While an extensive land registration and certification effort is on-going, analysis has demonstrated that current land-related policies are incomplete and conflicting and inhibit integrated and efficient land use (Gebeyehu, et al. 2017). Additionally, the lack of land use policy has led to fragmentation of agricultural land and negative impacts on food security, livelihoods, and the national economy. Regions have considerable autonomy to develop land use policies such that land governance varies by region; in some areas, pastoralists have registered communal land use rights, for example in Oromia National Regional State.

The current Draft Integrated Land Use Policy, 2019 is in progress and led by the Ministry of Agriculture and Natural Resources Rural Land Administration and Utilisation Directorate. There are hopes that it will be an integral part of the country's Third Growth and Transformation plan, 2020-2024. While the policy supports overall resilience in the livestock sector and among pastoralists and agro-pastoralists, there is no direct reference to climate impacts to livestock or adaptation or mitigation actions.

Remarkably, Ethiopia's 1997 Environment Policy strongly highlights "atmospheric pollution and climate change" as a key policy area. Policy strategies include promoting a climate change impacts monitoring program. The policy makes the bold statement that even "at an insignificant level of contribution to atmospheric greenhouse gases, a firm and visible commitment to the principle of containing climate change is essential and to take the appropriate control measures for a moral position from which to deal with the rest of the world in a struggle to bring about its containment by those countries which produce large quantities of greenhouse gases."

Regarding livestock, the Environment Policy largely portrays livestock as a driver of land degradation that has resulted in lost agricultural production and diminished agricultural potential. It calls for improved livestock management practices, including stall feeding, to encourage grazing land revegetation and soil integrity.

Table 19. Ethiopia environmental and land policy summary

Ethiopia Land and Environment Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
Environment Policy of Ethiopia, 1997	To improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole...	To promote monitoring climate change impacts; to commit to containing climate change through appropriate control measures	No policy objective specific to livestock but includes a focus on addressing land degradation through improved livestock management	Livestock Sector: Adaptation 1 Mitigation 1 Includes a focus on integrating this policy across sectors and government levels	N/A	N/A
Draft Integrated Land Use Policy, 2019	To guide allocation of the nation's lands for their optimal use in a manner that is sustainable and conserves the natural resources and the environment they support	N/A	-Browsing and feed source areas shall be delineated, mapped, and grassland ecosystems protected and improved. - The land use rights of pastoralists and agro-pastoralists over communal landholdings shall be protected.	Livestock Sector: Adaptation 1 Mitigation 1 Recognises the threat of drought exacerbated by climate change and includes actions to support climate resilience but no direct reference to adaptation or mitigation.	Ministry of Agriculture and Natural Resources Rural Land Administration and Utilisation Directorate	N/A

Uganda findings

Uganda has long recognised the threat of climate change as evidenced in the National Environmental Policy, 1995. Across policy areas, there is consistent recognition of climate risks and impacts to the country's agricultural production. There is less dedicated attention, however, to the livestock sector. Uganda's NAP-Ag, 2018, notes that livestock contributes just 1.9 percent to the country's GDP which may account for the somewhat limited attention devoted to the sector across policy areas. Climate adaptation strategies in the livestock sector are referenced but rarely well-elaborated outside of the recent NAP-Ag framework.

Meanwhile, livestock sector mitigation strategies are absent or nascent across policy areas outside of the country's REDD+ Strategy, 2017, and NAMA for the dairy sector, 2017. In contrast to Kenya and Ethiopia where development policy fairly strongly integrates climate-livestock issues, Uganda's national development policies (NDP II, Green Growth Development Strategy) give them less attention. Uganda did, along with Ethiopia, join the Global Research Alliance on Agricultural Greenhouse Gases in 2018.

Uganda's climate dedicated policies began somewhat later than those in Kenya or Ethiopia, outside of the 2007 NAPA. After the NAPA, the National Climate Change Policy (NCCP), 2015, was the next climate policy and is the foundation of the country's climate action. The policy notes that, like the EAC regional policy, it emphasises adaptation over mitigation. The NCCP includes agriculture as a priority sector and provides brief treatment of a range of livestock sector adaptation strategies from improving natural resource management and water availability, to supporting value chains and breeding, to better climate information services and early warning systems. The NCCP also aims to mainstream mitigation in agriculture but provides just one mitigation strategy for the livestock sector (sustainable rangeland management).

Uganda's development and agriculture policies include the aim to transform agriculture towards commercialisation and increase agricultural exports three-fold from 2015 to 2020. These ambitious goals are important for economic development, but the lack of policy focus on integrating mitigation measures and limited recognition of the role of pastoralists create two distinct risks—dramatically increasing livestock sector emissions and excluding

pastoralists from development and resilience initiatives. Uganda's livestock sector is guided by the Agriculture Sector Strategy Plan (ASSP), 2015, and NAP-Ag framework in addition to development policy. The ASSP provides numerous strategies for livestock breeding and feeding that provide important opportunities for adaptation and mitigation, however, strategies tend to target productivity with little explicit integration of climate resilience or mitigation. The ASSP does reference a national climate smart agriculture initiative and the NAP-Ag released in 2018 could shift government focus toward adaptation and mitigation co-benefits.

The NAP-Ag framework provides a robust approach to livestock sector adaptation action and well-detailed strategies. The framework includes a thorough evaluation of current and projected climate change impacts, the policy context for agriculture, and strategies responsive to the climate and policy context. The NAP-Ag builds on the foundation of the NCCP and the country's development policy (NDP II) and is aligned with the country's NDC. The NAP-Ag used compatibility with these three policies as a criterion for prioritising its adaptation actions. The NAP-Ag, however, shifts away from the National Agriculture Policy's focus on promoting commercial agriculture noting that this focus is inconsistent with the reality of many smallholders. The National Agriculture Policy calls for "transforming subsistence farming to sustainable commercial agriculture," however lacks sufficient recognition that around the country, many livestock owners and farmers are small-scale and have limited labour or financial capacity to shift to commercial farming (NAP-Ag, 2018).

Uganda's National REDD+ Strategy and Action Plan, 2017, and NAMA for climate-smart dairy livestock value chains, 2017, provide the most detailed rational, strategies, and implementation guidance for mitigation. While mitigation focused, each policy has important potential adaptation co-benefits particularly related to increasing livestock productivity through improving feed and water quality and availability (REDD+) and improved feed and value chains (NAMA). The NAMA explicitly aims to improve climate resilience in the dairy sector in addition to permanently reducing GHG emissions through a value chain approach. Uganda's NDC references livestock under "additional mitigation ambition" with the strategy of livestock breeding research and manure management. Livestock breeding is also referenced in REDD+ Strategy and manure management in the NAMA for the dairy sector but not in other policies as a mitigation strategy.

Uganda is participating in the Climate Investment Funds Pilot Programme on Climate Resilience (PPCR). The Strategic Programme on Climate Resilience component includes proposed investment projects for climate smart agriculture (including for livestock), improved natural resource management, and strengthening climate information services (CIF, 2017).

External actors in policy development

In terms of external actors in policy development, all policies list the involvement of external actors with the exception of the ASSP, 2015. Researchers from the CCAFS project on Policy Action for Climate Change Adaptation and others did participate in a review of the ASSP draft. It is unclear if there was other external support for the original draft. External actors listed in other policies include a range of bilateral and multi-lateral entities (e.g., Austrian Development Cooperation, Danish Embassy, Belgium Technical Cooperation, DFID, GIZ, FAO, UNICEF, UNDESA, UNDP, UNEP, UNFPA, UN-OHCHR, UN-REDD, UN Women, World Bank), research and programming entities (e.g., ILRI, CCAFS), and private sector entities (e.g., Deloitte Tohmatsu Financial Advisory LLC, Ford Foundation, Environmental Management Associates, Development Consultants International Ltd). See policy summary tables below for more detail.

Uganda climate-livestock policy opportunities for engagement summary

Strongest synergies across policies

- Improving natural resource management (including rangeland management and sustainable land management) is the most commonly identified adaptation strategy and one of the most prominent mitigation strategies.
- Uganda's focus on commercialisation, particularly across agriculture and development policy, is likely to make value chain and market system interventions appealing. The NAMA for the dairy sector, "Climate-smart dairy livestock value chains in Uganda," takes this approach.
- The NAP-Ag, 2018, provides the most holistic approach to livestock sector adaptation, is aligned with NDP II, and has synergies with adaptation strategies across policy areas.

Key gaps

- There is a need to better integrate livestock into climate policies and climate into livestock policies for adaptation and mitigation objectives.
- Robust strategies for mitigation in the livestock sector are absent or nascent across policy areas outside of the REDD+ Strategy and NAMA for the dairy sector.
- Robust options to support adaptation in extensive livestock systems are lacking including insufficient attention to mobility, protecting rangelands from encroachment and degradation, and improving feeding in pastoral production. The focus on commercialisation and agricultural intensification and limited attention to pastoralism risks leaving pastoralists behind.
- Efforts to explore livestock insurance options are minimal; agriculture insurance is only referenced in the NCCP, NDP II, and NAP-Ag.

Potential conflicts

- Uganda's National Agriculture Policy, 2013, has a focus on commercialisation of agriculture with limited integration of mitigation strategies; this could lead to increasing GHG emissions.
- The NAP-Ag framework, 2018, discusses the limited relevance for many smallholders of focusing on commercialisation in agriculture (the aim of the National Agriculture Policy). With the NAP-Ag just released in November 2018, it remains an open question whether the NAP-Ag or National Agriculture Policy will drive government interventions.

Adaptation synergies, conflicts and gaps

For the livestock sector, Uganda's agriculture and development policies are largely focused on sector growth mainly through intensification. Agriculture Sector Strategic Plan, 2015-2020, provides detailed growth-oriented strategies. This focus carries over into climate policy strategies for the sector which emphasise productivity and value chain and market systems support. While support for sectoral growth is key, there is some risk that in the push to grow, climate change adaptation measures could be overlooked. The NAP-Ag provides an important response to this trend with detailed strategies for livestock sector adaptation. Additionally, the NCCP and NDC provide guidance for sector resilience although strategies are fairly general.

While adaptation strategies are not often well-detailed outside of the NAP-Ag framework, there is fairly strong adaptation strategy coherence across climate, livestock and agriculture, and development policies as well as the Land Use Policy, 2006. Natural resource management, water access, breeding, and improving market systems focus are particularly prominent.

Across policy areas, strategies address near and longer-term adaptation efforts including climate smart agriculture. In practice, however, government has been oriented toward near-term actions including disaster risk reduction and humanitarian action (NAP-Ag, 2018). The government has supported climate smart agriculture practices although adoption rates have been low (NAP-Ag, 2018). The NAP-Ag framework aims to address these gaps and promote production, productivity, and resilience across all agriculture sub-sectors.

Extensive livestock production receives little attention from growth or adaptation-oriented strategies in climate, agriculture, or development policies outside of the NAP-Ag framework. The NAP-Ag framework and land policies provide the most detailed strategies for keeping pastoral areas intact and promoting sustainable land management.

Pastoral mobility

While Uganda's Land Policy, 2013, provides a sound basis for protecting the land rights of pastoralists, NDP II includes no mention of pastoralism and does not integrate provisions to secure rangelands from being converted to other uses. Further, in contrast to National Land Policy statements, technocrats still perceive communal pastoral land ownership as inefficient and backward (Byakagaba, et al., 2018). The National Land Policy also calls for development of a pastoral lands policy by the Ministry responsible for livestock which has not yet been developed. In most policies, there is very little attention to pastoralism while other policies raise concerns about pastoralism and mobility. The NAPA, 2007, for example, notes that migrating livestock spread disease and the REDD+ Strategy calls for the "reduction of extensive free-grazing of traditional livestock" due to limited forage in rangelands and intensifying livestock production. Meanwhile, communal rangeland is increasingly being fraudulently registered by local elites, cultivation and mining are encroaching on rangelands, and a need remains for mapping and protecting pastoralist corridors to enhance pastoralists' resilience (Byakagaba, et al., 2018).

Coherence among adaptation actions

There is the most coherence across policy areas for improved natural resource management, value chains, and water access and availability. **Improved natural resource management** and sustainable land management are the most commonly identified strategies with only the NAMA for the dairy sector not explicitly including them. Strategies reference sustainable rangeland and pasture management, encouraging agro-forestry, disseminating appropriate technologies and practices, and improving capacity. Both land policies offer substantial support for natural resource management through a range of strategies including classifying agro-ecological zones and linking them to land use improvement activities, soil and water conservation, and restoration.

With Uganda's strong emphasis on shifting to commercial production, strategies across policy areas emphasise improving value addition and market linkages in **value chains**. Strategies include investing in agro-processing; expanding access to markets and micro-finance; and strengthening quality assurance, regulation, and labelling. Strategies also include a focus on **improving post-harvest handling and storage** to avoid climate-related losses of meat and milk including through technologies, infrastructure, and capacity. Strategies to **improve water access and availability** are also present across policy areas and interestingly are emphasised more commonly than those to improve feeding. In addition to broadly calling for improvement, strategies include rainwater harvesting, drinking water dams, pasture water resource development, expanding small-scale water infrastructure and irrigation, and restoring wetlands to improve livestock water availability. The NAP-Ag framework notes that irrigation schemes face a risk of maladaptation.

Across policy areas (although not in all policies), there are strategies to **improve feeding** with a focus on intensive and semi-intensive production systems. Strategies include promoting pasture production and productivity, harvesting, and storage and agro-forestry with fodder species. While generally more focused more on productivity than adaptation, the ASSP provides detailed improved feeding strategies including establishing a national animal feed quality analysis laboratory, strengthening supply systems for pasture and fodder seed and feed, and supporting development of a commercial feed industry and animal feeds regulatory system.

Outside of land policy, policies call for **improved breeding**. The NAP-Ag framework strategies include community breeding schemes, artificial insemination services in district centres, rehabilitating livestock breeding centres, and building extension capacity related to breeding. Other policies reference breeding but provide little detail. The ASSP provides breeding strategies for dairy and beef cattle, goats, and chickens; although these are not specifically targeted at adaptation, adaptation is a policy cross-cutting issue. ASSP strategies include developing breeding schemes for cross-breeding, implementing AI, screening local goat breeds for productivity, restocking with high quality dairy breeds, and establishing exotic poultry layer and broiler grandparent stock farms.

Climate policies that include an adaptation focus (NAPA, NCCP, NDC, NAP-Ag) include strategies to **strengthen early warning systems** as do agriculture policies, NDP II, and the Land Use Policy. Strategies reference early warning system coordination, communication, and effective forecasting but are not well-detailed outside of the NAP-Ag framework. NAP-Ag strategies include integrating use of indigenous knowledge into community early warning systems, establishing community information platforms to facilitate and disseminate early warnings, and ensuring warnings are easily understood by authorities and end users.

Strategies to **establish and improve climate information services** are present across policy areas although not consistently and not provided in detail. Strategies are limited to general calls for expanding and improving weather observation networks, meteorological data collection capacity, and climate information communication. Interestingly, the Land Use Policy along with the NAP-Ag, call for promoting and integrating indigenous knowledge about weather forecasting and coping strategies.

Agriculture policies and two climate policies (NAP-Ag, NAPA) reference **improved disease control**. Agriculture policies provide the most detailed strategies including improving vaccination services; strengthening disease control through policy, legislation, and capacity; and early detection. The Land Use Policy, NAPA, NCCP, and NAP-Ag each provide a strategy for **livelihood diversification** although with little elaboration.

Climate smart agriculture in the context of adaptation is well-discussed in the NAP-Ag framework and mentioned briefly in other climate policies as well as the ASSP and GDDS (the NAMA and REDD+ Strategies include CSA focused on mitigation strategies). Only the NCCP, ASSP, and NAP-Ag reference insurance in agriculture and only the NAP-Ag

specifically includes **livestock insurance**. Some policies also reference promoting relevant **research and technology** and **improving extension services**. The ASSP also includes a strategy to set up **climate smart villages** to demonstrate CSA in climate vulnerable areas.

Table 20. Policy adaptation strategies: Uganda summary

Policy	Adaptation strategies indicated, Uganda									
	Improve NRM/SLM	Support market linkage and value chains	Improve water access and availability	Improve breeding	Establish/ improve early warning systems	Increase climate information	Improve post-harvest/storage	Improve feed/grazing	Improve disease control	Livelihood diversification/ alternative livelihoods
Climate										
NAPA, 2007	x	x	x	x	x	x	x	x	x	x
NCCP, 2015	x	x	x	x	x	x	x			x
NDC, 2015	x	x	x	x	x	x	x			
REDD+ Strategy, 2017	x		x	x				x		
NAMA, 2017		x						x		
NAP-Ag, 2018	x	x	x	x	x	x	x	x	x	x
Livestock/Ag										
National Ag Policy, 2013	x	x	x		x	x	x	x	x	
ASSP, 2015	x	x	x	x	x		x	x	x	
Development										
NDP II, 2015	x	x	x	x	x	x	x		x	
GGDS, 2017	x	x	x	x						
Land/ Environment										
Land Use Policy, 2006	x	x	x		x	x		x	x	x
National Land Policy, 2013	x									

Mitigation synergies, conflicts and gaps

Climate mitigation in the livestock sector is not well-integrated in much of Uganda's climate, agriculture, development, or land policies. The REDD+ Strategy and NAMA for the dairy sector are the key policies for mitigation and provide the only substantive strategies. The National Agriculture Policy has no reference to mitigation. The NDP II references mainstreaming climate mitigation but offers no livestock specific strategies. The ASSP, a key driver of livestock sector development references low-carbon development pathways and climate smart agriculture but does not provide any dedicated strategies. Uganda's NDC includes the estimated emissions from enteric fermentation but does not include a target for emissions reduction in the livestock sector. Under "additional mitigation ambition," the NDC does mention livestock breeding research and manure management practices. In the National Climate Change Policy, the only explicit reference to mitigation in the livestock sector is to promote sustainable rangeland management. The NAP-Ag Framework includes a principle of promoting mitigation co-benefits. In general, the country's mitigation focus appears to be on forestry and non-agriculture sectors.

Coherence among mitigation actions

Strategies to **increase productivity and efficiency** are fairly broad and generally encompass the strategies related to feeding and breeding although the NAMA includes a focus on post-production efficiencies in milk collection, cooling, and storage. Interestingly, the REDD+ Strategy specifically addresses increasing **livestock water access** to increase productivity. In terms of **implementing climate smart agriculture**, there are general references; specific strategies are captured in the other mitigation categories. **Improved natural resource management** and rangeland management strategies include reducing forest clearing for pastures, agro-forestry for fodder species, and restoration initiatives.

Improved feeding as a mitigation strategy is only described in the REDD+ Strategy and NAMA, however, these strategies are better detailed than others. They include feed supplements and additives (including plant oils and extracts and rumen modifiers), improved forage, fodder trees and shrubs, hay production, a feed standards and certification system, and utilisation of industrial by-products such as brewers and biofuel waste. The NDC and REDD+ Strategy reference **livestock breeding** including research and introducing exotic breeds and

cross-breeds. **Improved manure management** is referenced in the NDC and the NAMA describes converting manure to biogas and sludge through biodigesters.

Additionally, the NAMA aims to establish an **MRV system** and measure progress toward emissions reduction and sustainable development using the UNDP Climate Action Impact Tool and the Tier 1 method. The GDDS calls for “enhancing the livestock mix” although there is no elaboration.

Table 21. Policy mitigation strategies: Uganda summary

Policy ¹³	Mitigation strategies indicated, Uganda						
Document	Increase productivity/efficiency	Improve NRM/rangeland management	Implement CSA	Improve feeding	Improve breeding	Improve manure management	Increase water access
Climate							
NAPA, 2007							
NCCP, 2015		x					
NDC, 2015			x		x	x	
REDD+ Strategy, 2017	x	x	x	x	x		x
NAMA, 2017	x		x	x		x	
NAP-Ag, 2018 ¹⁴	x	x	x	x	x		x
Agriculture & Livestock							
National Ag Policy, 2013							
ASSP, 2015			x				
Development							
NDP II, 2015-2020 ¹⁵							

¹³ There are no livestock mitigation strategies indicated in NAPA, National Agriculture Policy, NDP II, or Land Use Policy.

¹⁴ The NAP-Ag is focused on adaptation but aims to promote mitigation co-benefits which would be relevant in these areas.

¹⁵ NDP II references adopting mitigation policies and practices that have adaptation co-benefits but provides no strategies with particular relevance to the livestock sector.

Policy ¹³	Mitigation strategies indicated, Uganda						
Document	Increase productivity/efficiency	Improve NRM/rangeland management	Implement CSA	Improve feeding	Improve breeding	Improve manure management	Increase water access
GGDS, 2017	x						
Land & Environment							
Land Use Policy, 2006							
National Land Policy, 2013		x					

Enabling and disabling conditions

Livestock adaptation and mitigation efforts in Uganda face the constraints of the overall livestock sector. This includes the lack of a holistic government approach to agriculture until recently (NAMA, 2017). The ASSP, 2015, identifies specific constraints on the sector including:

- a weak policy and regulatory framework,
- production constraints including limited availability of quality feeds,
- land tenure and water rights issues that affect water availability for agricultural production,
- weak monitoring and evaluation system and statistics,
- poor post-harvest handling and processing capacity,
- poor markets and marketing infrastructure, and
- limited technical capacity among government agriculture staff.

The NAP-Ag further examines constraints related to overlapping mandates among government entities leading to conflicts or lack of accountability and weak institutional coordination among the Ministry of Agriculture and Ministry of Water and Environment. The NAP-Ag notes that the Climate Change Department faces low staffing and that skewed budget allocations leave climate impacted sectors including agriculture, natural resources, and land management with the smallest proportion of the budget. Additionally, national policies rarely include adequate consideration of community-level social, cultural, environmental and economic challenges and contexts (NAP-Ag, 2018).

Ampaire, et al. (2017) found that in Rakai district, many climate related policy strategies were not being implemented due to a disconnect between national and district level authorities, inadequate consultation with stakeholders, lack of technical capacity to implement adaptation strategies, insufficient budgets, and political interference.

The NAMA identifies additional conditions inhibiting the dairy sector, many of which are also relevant for broader livestock sector adaptation and mitigation including:

- low animal productivity due to poor feeding and animal health;

- low level of commercialisation and lack of regulation of hay and concentrated feed production;
- low adoption of improved management practices and technologies;
- no standards or labelling for animal feeds;
- extremely limited infrastructure for collection, storage and chilling of milk across the country;
- limited incentives for smallholders and informal milk traders to participate in the formal segment; and
- no quality control, standards, or labelling for milk production.

In addition to issues of support for mobility (see previous section), an issue of concern in rangelands is that a rush to secure mineral and oil mining deposits is threatening communal rangelands including through cases of land grabbing. Many customary owners lack formalised rights over land and are unable to exclude mining interests or benefit from royalties sharing (Land Policy, 2013). There are concerns that communal land holders are being displaced with inadequate compensation and resettlement options. While customary tenure remains the primary type of tenure in much of Uganda, traditional institutions of land governance and management have not been legally accepted and integrated (Land Policy, 2013). The REDD+ Strategy identifies the lack of adoption of the Draft Rangeland Management and Pastoralism Policy (2014) as a disabling condition. Additionally, the country does not have a dedicated livestock policy.

Transboundary impacts

The Nile basin covers about 98 percent Uganda. Surface water from most of the country drains into the White Nile and into South Sudan, an estimated 37 km³/year (FAO, 2014). A sliver of land along the border with Kenya is part of the Rift Valley basin. Uganda's rather prominent focus on improving livestock water access and availability could influence this transboundary surface flow although only to a very minor extent relative to other types of interventions such as hydropower. The National Land Policy states that the government will develop a framework for participation in development of policies and protocols for transboundary natural resource management in consultation with Partner States.

Additionally, the National Land Policy states that the government will develop a framework to regulate, manage, and mitigate the negative consequences and maximise the positive impacts of cross-border population movements. The NCCP also addresses population movements noting that disaster risk management will need to increasingly address transboundary issues as disasters and refugees move across borders.

In contrast to Kenya and Ethiopia, Uganda has less extensive disease control strategies and little discussion of the transboundary dimension of livestock disease control.

Uganda's agriculture and development policies aim to increase agricultural exports three-fold from 2015 to 2020 which if realised could impact agricultural market in neighbouring countries.

Policy integration

While climate impacts are recognised in Uganda's policies, policy responses through well-developed adaptation and mitigation strategies are weaker than those of Kenya or Ethiopia. This section examines each policy area (climate, livestock and agriculture, development, land, and environment) for integration of livestock sector climate change adaptation and mitigation and alignment with the SDGs and national development goals. Policies were scored for extent of integration of livestock sector adaptation and mitigation (Table 22). Higher scores designate more dedicated and detailed climate related strategies for the livestock sector. The analysis also examined the key actors in policy development as described in the policy. Where external actors were identified, these are included in brackets.

Table 22. Uganda policy integration of livestock sector adaptation and mitigation summary

Uganda	Livestock Adaptation score	Livestock Mitigation score
Climate Policy		
Climate Average	2.3	1.7
NAPA, 2007	3	1
National Climate Change Policy, 2015	3	1
NDC, 2015	2	1
National REDD+ Strategy and Action Plan, 2017	1	2
NAMA, Climate-smart dairy livestock value chains in Uganda, 2017	2	3
NAP-Ag, 2018	3	2
Livestock & Agriculture Policy		
Livestock & Agriculture Average	2	0.5
National Agriculture Policy, 2013	2	0
Agriculture Sector Strategic Plan 2015-2020	2	1
Development Policy		
Development Average	1.5	1
National Development Plan (NDP II), 2015/16-2019/20 (Vision 2040)	2	1
Green Growth Development Strategy 2017/18 - 2030/31	1	1
Land & Environment Policy		
Land & Environment Average	1.5	0.5
National Land Use Policy, 2006	2	0
National Land Policy, 2013	1	1

Climate policy

Uganda's climate policies show strong broad alignment with international and national development goals but are mixed in the extent to which each supports livestock sector adaptation and mitigation action. The country's first climate policy, NAPA, 2007, included livestock adaptation in projects 2, 5, and 6 for land degradation management, water for production, and drought adaptation respectively. The NAPA has mitigation co-benefits related to improved natural resource and rangeland management. Some have criticised NAPA implementation as deficient, however, the NAPA process did kick-start national level adaptation planning (Ampaire, et. al., 2017).

The country's next climate change policy came in 2015, the National Climate Change Policy (NCCP). The NCCP is strong on adaptation in the livestock sector but the only livestock

specific mitigation strategy is sustainable rangeland management to address soil and land degradation and associated emissions. The NCCP lays out legal and regulatory frameworks and defines actor roles and mechanisms for coordination although explicit guidance on how agencies will work together is lacking (Ampaire, et al., 2017).

Later in 2015, the country submitted its NDC also focused on adaptation including in the livestock sector. NDC adaptation strategies are fairly general but address breeding and rangeland management among others. NDC mitigation strategies for livestock are listed under additional mitigation ambition and simply state “livestock breeding research and manure management practices.”

Uganda’s NAP-Ag, 2018, takes the most holistic approach to adaptation in the livestock sector. It also includes a guiding principle to promote mitigation co-benefits, although mitigation measures receive no further dedicated treatment in the document. Priority actions for the livestock sector include improved breeds, feeding, sustainable land management, animal health management, livelihood diversification, and livestock value chains.

Uganda’s National REDD+ Strategy and Action Plan, 2017, and NAMA for climate-smart dairy livestock value chains, 2017, are the most detailed policy documents and while mitigation focused, each has important adaptation co-benefits. The NAMA explicitly aims to improve climate resilience in the dairy sector in addition to permanently reducing GHG emissions.

At one point, Uganda was seeking preparation support for the NAMA “Developing appropriate strategies and techniques to reduce methane emissions from livestock production in Uganda.” The consultant did not identify a document to review at this time and it is not clear if this effort is ongoing.

Table 23. Uganda climate policy summary

Uganda Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
NAPA, 2007	Prioritise national adaptation actions	Same as overall	Promote community best practices of collaborative natural resource management	Livestock Sector: Adaptation 3 Mitigation 1 Aligned with MDGs and country development policy	Ministry of Water, Lands and Environment; National Climate Change Steering Committee [UNEP]	Government of Uganda, Bi-laterals, Multilaterals, NGOs and CBOs
National Climate Change Policy, 2015	To ensure a harmonised and coordinated approach towards a climate resilient and low-carbon development path for sustainable development in Uganda.	Same as overall	- Promote climate change adaptation strategies that enhance resilient, productive and sustainable agricultural systems. - To mainstream climate change mitigation in the management of natural resources.	Livestock Sector: Adaptation 3 Mitigation 1 Aligned with SDGs and country development policy	Ministry of Water and the Environment [Danish Embassy, Belgium Technical Cooperation, DFID, and World Bank]	Public, private, and development partner sources

Uganda Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
NDC, 2015	To ensure that all stakeholders address climate change impacts and their causes through appropriate measures, while promoting sustainable development and green growth	Same as overall	- To reduce vulnerability and address adaptation in agriculture and livestock - (Additional mitigation ambition) livestock breeding research and manure management practices	Livestock Sector: Adaptation 2 Mitigation 1 Aligned with SDGs, NDP II, and NCCP	Ministry of Water and the Environment [FAO, etc.]	National sources are assumed to cover ~30% of incremental costs in the next 15 years, with 70% assumed to originate from international sources
National REDD+ Strategy and Action Plan, 2017	To turn current wood and biomass extraction into sustainable abatement activities	Same as overall	To improve and intensify livestock management to reduce the need for clearing forests for pasture lands	Livestock Sector: Adaptation 1 Mitigation 2 Aligned with SDGs and NDP II	Ministry of Water and the Environment; Forestry Sector Support Department [World Bank (Forest Carbon Partnership Fund), Austrian Development Cooperation, and UN-REDD]	National, district, and local budgets; carbon trading options; explore options from investors, cooperatives, industries, and rural households

Uganda Climate Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
NAMA, Climate-smart dairy livestock value chains in Uganda, 2017	To trigger resilient low-carbon development in the dairy sector through the introduction of climate-smart agricultural practices	Same as overall	Reduce emissions from enteric fermentation and animal manure management	Livestock Sector: Adaptation 2 Mitigation 3 Aligned with SDGs and NDP II	Ministry of Agriculture, Animal Industry and Fisheries [UNDP, Deloitte Tohmatsu Financial Advisory LLC, ILRI]	Yield Uganda Investment Fund; Africa Agricultural Development Company; government, donors
NAP-Ag, 2018	To reduce vulnerability and enhance adaptive capacity of Uganda's agricultural sector to the impacts of climate change in order to achieve sustainable agricultural development	Same as overall	Promote climate resilient livestock production systems and value chains	Livestock Sector: Adaptation 3 Mitigation 2 Aligned with SDGs, NCCP, NDP II, and NDC	Ministry of Agriculture, Animal Industry and Fisheries [FAO, UNDP BMUB]	Ministry of Agriculture, Animal Industry and Fisheries budget, national budget, GEF, development partners, GCF

Livestock and agricultural policy

Uganda's National Agriculture Policy, 2013, recognises climate change as a threat to agricultural productivity. It includes two strategies that directly addresses climate change—(a) sustainable resource management to reduce the effects of climatic shocks and (b) developing institutional capacity to address climate change. Although other strategies are relevant to climate change, there are no other dedicated adaptation or mitigation strategies. Regarding livestock, there are also few dedicated strategies, although broader strategies related to extension, supply systems, value addition, etc. are relevant. With a mission to “transform subsistence farming to sustainable commercial agriculture,” overall the strategy is aimed at promoting the production, processing, marketing, and trade systems and infrastructure associated with commercial production.

The Agriculture Sector Strategic Plan (ASSP), 2015-2020, shares the National Agriculture Policy mission regarding commercial agriculture and has a policy goal of achieving an average annual growth rate of six percent in the agriculture sector. ASSP has specific targets for increased production in 12 priority commodities including dairy and meat (cattle, goat, and poultry). The ASSP includes detailed livestock sector strategies for increasing production and productivity. The Plan includes climate change as a cross-cutting issue and devotes a brief section to broad strategies (e.g., increasing productivity through climate smart agriculture practices). However, dedicated budgeting is very minimal for adaptation and does not exist for mitigation. There is little discussion of and no identified monitoring for livestock sector specific adaptation or mitigation.

Table 24. Uganda livestock and policy summary

Uganda Livestock/ Agriculture Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
National Agriculture Policy, 2013	To achieve food and nutrition security and improve household incomes through enhancing sustainable agricultural productivity and value addition, providing employment opportunities, and promoting domestic and international trade.	N/A	N/A	Livestock Sector: Adaptation 2 Mitigation 0 Aligned with national development policy	Ministry of Agriculture, Animal Industry and Fisheries [Un-named development partners]	Not specified other than support from development partners
Agriculture Sector Strategic Plan, 2015-2020	To achieve an average growth rate of 6 percent per year over the next 5 years.	To ensure that these cross-cutting issues (including climate change) are adequately mainstreamed in all activities implemented in the sector	To increase dairy and meat production and productivity through access to critical inputs, improving agricultural markets and value addition, and improving service delivery	Livestock Sector: Adaptation 2 Mitigation 1 Aligned with SDGs, NDP II, and National Agriculture Policy	Ministry of Agriculture, Animal Industry and Fisheries [Researchers from the CCAFS project on Policy Action for Climate Change Adaptation participated in a review of the draft]	National budget framework, development partners, and private sector

Development policy

Uganda's development policies recognise the significance of agriculture to the economy but provide limited references to livestock sector adaptation and mitigation. The NDP II notes that agriculture accounts for about 25 percent of GDP and about 72 percent of the labour force (formal and informal). Agriculture is one of the five NDP II primary investment areas and livestock (dairy cattle and beef cattle) are one of 12 priority value chains identified for investment to increase production and productivity. "Increase in local beef consumption per capita" is a medium term expected result. NDP II prioritises intensive livestock production measures and includes no mention of pastoralists or extensive livestock production.

The NDP II does include climate change as a cross-cutting issue and calls broadly for strengthening climate resilient technologies and practices in agriculture. There is little discussion of livestock sector specific climate change impacts or adaptation or mitigation strategies, although livestock water access is highlighted. Strategies for natural resource management are not explicitly linked to the livestock sector. NDP II makes one reference to an "Export Goat Breeding and Production Project" but this is the only mention of non-cattle livestock.

Uganda developed its Green Growth Development Strategy (GGDS) 2017/18 – 2030/31 to operationalise green growth principles and accelerate the implementation of global development goals, Vision 2040 and NDP II. GGDS is even more limited than NDP II in treatment of the livestock sector. It does highlight agriculture as one of five target areas for green growth and includes "climate change adaptation and mitigation" as one of eight target outcomes. There are brief references to the use of groundwater for livestock use and achieving agriculture emissions reductions through "livestock mix and management" and livestock yield increase but no elaboration. There are broader references to conservation agriculture and NRM strategies but not specific to livestock.

Table 25. Uganda development policy summary

Uganda Development Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
National Development Plan (NDP II), 2015/16-2019/20 (Vision 2040)	To propel the country towards middle income status by 2020 through strengthening competitiveness for sustainable wealth creation, employment and inclusive growth.	Key cross-cutting issues (including climate change) will be mainstreamed in government programmes and projects during the implementation, monitoring and evaluation of the Plan.	N/A For agriculture: Increase sustainable production, productivity and value addition in key growth opportunities (including agriculture)	Livestock Sector: Adaptation 2 Mitigation 1 Aligned with SDGs	National Planning Authority [World Bank, UNDP, UN Women, UN-OHCHR, UNICEF, UNFPA, UNDESA, FAO, GIZ, and others]	Public financing, private financing including PPPs, development partners
Green Growth Development Strategy 2017/18 - 2030/31	An inclusive low emissions economic growth process that emphasises effective and efficient use of the country's natural, human, and physical capital while ensuring that natural assets continue to provide for present and future generations.	To ensure that the social and economic transition is achieved through a low carbon development pathway that safeguards the integrity of the environment and natural resources.	N/A For agriculture: Sustainable agriculture production through upgrading the value chain of strategic commodities and enterprises with a focus on irrigation and integrated soil fertility management.	Livestock Sector: Adaptation 1 Mitigation 1 Aligned with SDGs and NDP II	National Planning Authority in partnership with the Climate Change Department (Ministry of Water and Environment) [UNDP, Global Green Growth Institute]	Public sector allocations; environmental fiscal reforms and subsidy reforms; certification of sustainable production enterprises; green innovation and payments for ecosystem services; and international funding; etc.

Land and environmental policy

Uganda's National Environmental Management Policy (NEMP), 1995, aims to address soil degradation, deforestation, loss of biodiversity, and pollution by establishing a more comprehensive and integrated approach to environmental issues. The NEMP creates a National Environment Management Authority, a monitoring and evaluation system to track the effects of different policies, and attempts to promote a sustainable conservation culture (Grantham, 2017). The NEMP recognises climate as a "vital natural resource" that needs to be monitored in order to better direct land use, encourage sustainable economic development, and manage air pollution and GHG emissions (Grantham, 2017). The consultant was unable to obtain Uganda's full NEMP.

The Land Use Policy, 2006, recognises the impacts of climate variability and change and sets out strategies, inter alia, to increase long-term weather forecasting, early warning systems, irrigation, and soil and water conservation. Other strategies support overall resilience. The policy does not address climate mitigation. Interestingly, the Land Use Policy includes policy statements to encourage both rural-urban migration and resettlement of people away from over-populated areas to sparsely populated areas.

The National Land Policy, 2013, includes a section on strategies to protect the land rights of pastoralists and support pastoral development. The strategies include a sub-strategy to "develop particular projects for adaptation and reclamation of pastoral lands for sustainable productivity and improved livelihood of communities." Other sub-strategies include protecting pastoral lands from indiscriminate appropriation and ensuring that pastoral lands are held, owned and controlled by designated pastoral communities as common property under customary tenure. While the National Land Policy, 2013, includes zoning to establish appropriate agro-ecological zones, pastoral resource areas and access, and maintaining an equitable balance among land uses, NDP II includes no mention of pastoralism and does not integrate provisions to secure rangelands from being converted to other uses. Additionally, there is some evidence that government entities view extensive livestock production in communal systems negatively (Byakagaba, et al., 2018). The National Land Policy also calls for development of a pastoral lands policy by the Ministry responsible for livestock which has not yet been developed.

The National Land Policy includes policy statements for climate adaptation and mitigation. The associated strategies with potential relevance for the livestock sector include regulating GHG emitting activities including destructive agricultural practices, strengthening adaptive capacity, building rapid response capacity for extreme climate events, and providing resettlement for environmental refugees and internally displaced people. Other policy statements support improved natural resource management measures.

Table 26. Uganda environmental and land policy summary

Uganda Land and Environment Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
National Environment Management Policy, 1995	To address environmental issues by establishing a more comprehensive and integrated approach	Climate needs to be monitored in order to better direct land use, encourage sustainable economic development, and manage air pollution and GHG emissions	Unknown	Unknown	Unknown	Unknown
National Land Use Policy, 2006	To achieve sustainable and equitable socio-economic development through optimal land management and utilisation in Uganda	To promote practices and strategies that minimise the impact of climate variability and change.	To adopt improved agriculture and other land use systems that will provide lasting benefits for Uganda.	Livestock Sector: Adaptation 2 Mitigation 0 Aligned with Poverty Eradication Action Plan (PEAP), reference to UNFCCC	Ministry of Lands, Housing, and Urban Development [Environmental Management Associates (EMA), Development Consultants International Ltd (DCI), unnamed donors]	Government will develop innovative financial mechanisms including financial incentives to promote suitable land use and seek support from development partners

Uganda Land and Environment Policy	Overall policy goal	Policy objective(s), climate	Policy objective(s), livestock	SDGs and national development goals alignment	Key actors, policy development [external actors]	Finance sources
National Land Policy, 2013	To ensure an efficient, equitable and optimal utilisation and management of Uganda's land resources for poverty reduction, wealth creation and overall socio-economic development	N/A Policy statements include: Government shall, in its plans and programs mitigate and adapt to the impacts of climate change	N/A	Livestock Sector: Adaptation 1 Mitigation 1 Policy is to be implemented in the context of regional and international agreements and funded through the national development framework	Ministry of Lands, Housing and Urban Development [Ford Foundation]	Policy implementation should be budgeted through national development framework

Conclusion

This policy coherence analysis reveals a dynamic policy context for livestock sector adaptation and mitigation in Kenya, Ethiopia, and Uganda. As best practices in livestock climate change strategies are explored and established around the world, these countries are working to integrate them into climate policy and other policy areas to various degrees. This policy evolution is evidenced by the fact that more recent policies often provide the most comprehensive approaches and detailed strategies. Policies developed post-2015 are explicitly aligned with the SDGs with the exception of Ethiopia's livestock policies and Multi-Sector Investment Plan for Climate Resilience. These policies are, however, aligned with national development goals which themselves are aligned with the SDGs. A range of development partners frequently support policy development and integration of livestock sector adaptation and mitigation. While the development community plays a significant role in technical and financial support for policy development, policy implementation over the long-term relies on national ownership.

In each country, there are examples of strong policy guidance for livestock adaptation. Kenya in particular has policies across policy areas that support adaptation. In Ethiopia, more recent climate policies and the development policy support livestock adaptation while livestock, agriculture, land, and environment policies are less explicit. In Uganda, climate policies focused on adaptation tend to integrate livestock sector adaptation, however, other climate policies and other policy areas are weaker on this integration. At times, a newer policy's inclusion of climate considerations may put it at odds with previous policy direction. This is the case, to some extent, with Uganda's 2018 NAP-Ag framework which de-emphasises previous agriculture policy focus on commercialisation and shifts the focus to resilience.

In terms of mitigation in the livestock sector, examples of robust strategies are more limited. The best examples are Kenya's CSA Strategy and NCCAP, Ethiopia's CRGE-Green Economy Strategy, MISP, and GTP II, and Uganda's NAMA for the dairy sector. Comprehensive mitigation action in the livestock sector and sufficient consideration of adaptation-mitigation co-benefits remain a gap in many policies across countries and policy areas.

The key potential transboundary impact of these policies is related to livestock mobility and the spread of disease. Each country emphasises the need to control livestock disease, however, there is little consideration of how these disease control efforts could impact livestock mobility that is critical for climate resilience. The future of extensive livestock systems and pastoral mobility more broadly remains a question. While some policies aim to support communal land holdings and limit their fragmentation, it is clear that pastoral mobility is increasingly hindered by land development in grazing areas and along migratory routes. Other factors, including a government investment focus on intensive rather than extensive livestock production systems, particularly in Uganda, may also impact extensive production. Development of water resources also has transboundary implications, but livestock related interventions are unlikely to significantly change cross border flow.

Policies document enabling and disabling conditions and sources of finance to various degrees. Climate change impacts and limited governance capacity and finance are commonly mentioned as constraining policy actions. Previous policy and project implementation are occasionally cited as enabling. Documentation of previous policy implementation is best described in countries' five-year development plans. When sources of finance are identified, national budgets and support from development partners are most commonly cited.

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