

# REPUBLIC OF KENYA



## MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES AND COOPERATIVES

### POLICY OPTIONS FOR BUILDING RESILIENCE OF CROP PRODUCTION UNDER CLIMATE CHANGE

**CONTEXT:** Crop production in Kenya is over 90% rain-fed, making it highly vulnerable to changing weather patterns and extreme weather events, such as droughts and floods. In the recent past, many parts of Kenya have suffered droughts, while at the same time other parts have endured flooding because of intense rain causing major crop losses leading to food insecurity. There are currently about 1.3 million Kenyans chronically food-insecure due to drought conditions, primarily in ASALs, which increases to 3.4-3.7 million Kenyans during severe droughts. It is further estimated that 9 out of 10 crops will experience reduced growth rates (10-20%) with dramatic price increases (45-90%) by 2030 in part due to climate change. Beyond crop losses, these extreme events lead to loss of farm income, market instability and impacts on trade. These severe climate change impacts show that Kenya needs to make a paradigm shift in managing agriculture and invest in climate-smart agricultural practices to match the changing environment and increase productivity. Furthermore, compounded climate factors can decrease plant productivity, resulting in price increases for many important agricultural crops.

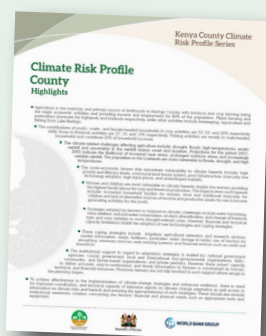
#### PRIORITY POLICY ACTIONS

1. **DEVELOP** Kenya's long-term vision for climate change and agriculture, and contribute to updating the agriculture component of Kenya's Nationally Determined Contributions (NDCs)
2. **STRENGTHEN** the coordination of climate change issues in the agricultural sector
3. **STRENGTHEN** acquisition and dissemination of climate data, information for enhanced advisories to farmers through ICTs
4. **SUPPORT** research, technology development and innovation and application of climate risk management tools and smart management practices
5. **IMPROVE** soil carbon, health and fertility for food security, adaptation and mitigation co-benefits

Timely interventions and support to farmers are urgently required to mitigate these events. Given the national economic, food security, nutritional and health importance of crop production, there is an opportunity for national policies on agriculture and climate change to support a more robust and resilient future for Kenya's food production.

#### CLIMATE RISK PROFILING FOR COUNTIES

Kenya has completed Climate Risk Profiles for 31 counties, which are helping stakeholders understand actions they can address climate change. Counties can use these to inform planning, decision making and implementation.



**TRENDS AND PROJECTIONS:** Kenya's average annual temperature has increased by 1°C since 1961, though this hides considerable variation: temperatures in western Kenya rose by 0.5°C, while in the drier parts of the country, temperatures went up by 1.5°C during the same period. Extreme climate events have become increasingly frequent in recent years, with direct negative consequences for annual agricultural production. Projections suggest further increases in mean annual temperature of 1.5°C to 2°C by 2030 and up to 3°C by the 2050s. In addition to rising temperatures, rainfall is projected to change in timing of the onset, distribution across the country, amount, and cessation of season, with extremes of too little and too much rain becoming more common. This causes impacts to crop productivity and other affects, such as land and soil degradation. Maize and beans—Kenya's most commonly grown crops—are projected to be most severely impacted by the changing climate, whereas sorghum, millet, cassava and potatoes are projected to be less impacted by climate change.

Alliance



THE AGA KHAN UNIVERSITY  
EAST AFRICA INSTITUTE



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



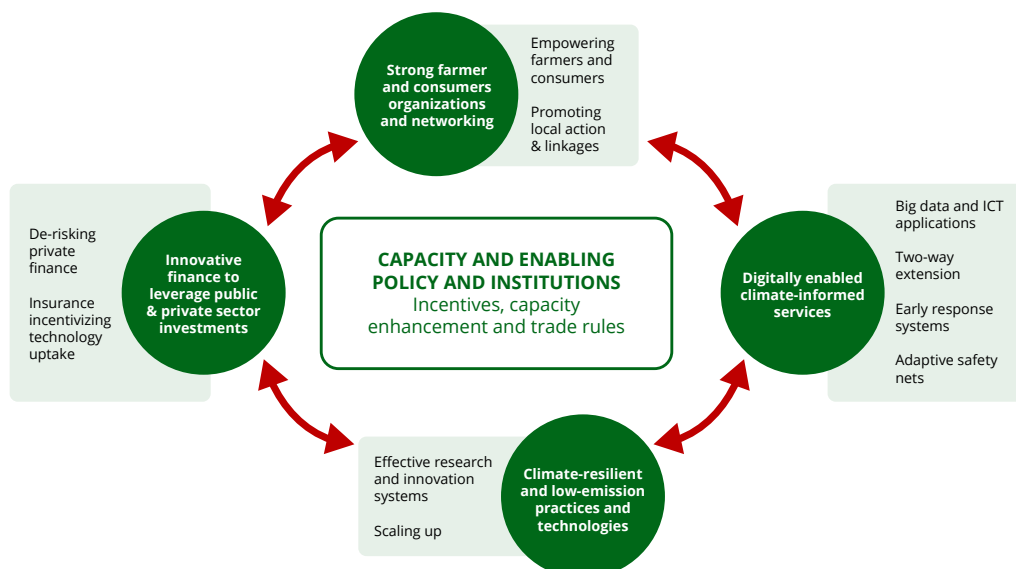
**INTERVENTIONS:** Climate-resilient technologies and practices are becoming increasingly important for safe-guarding agriculture and food security from climate impacts. It is important to identify interventions that are appropriate for the specific crop and climate impacts, in the specific local Kenyan county context. Climate Risk Profiles have been developed for 31 Kenyan counties showing the key risks and risk-reduction interventions for key agricultural commodities in each county. The interventions are diverse but targeted: promoting uptake of improved climate-resilient crop varieties (e.g. drought tolerant maize); improving soil fertility by increasing soil carbon; promoting large and small-scale irrigation; mechanization of climate-smart agriculture; controlling pests and diseases; managing post-harvest value chains (e.g. storage and cold chains); improving transportation infrastructure to access markets; risk management financing; and improving access to weather forecasts, agro-advisory services and climate-informed extension.

**CHALLENGES AND OPPORTUNITIES:** There are various challenges to implementing climate-resilient interventions at scale in Kenya, such as access to the right inputs, lack of farmer and agri-business access to information, extension and training, lack of financial capital for investing in climate-resilient technologies, and policy and institutional environments that need improvement to address these issues at national, county and sub-county levels. However, there are opportunities to address these challenges through policy actions. Kenya has a Climate-Smart Agriculture (CSA) Strategy as well as a CSA Implementation Framework, an agriculture component in its Nationally Determined Contribution (NDC) submitted to the UNFCCC, and there are major investments happening in the country to promote climate-smart agricultural technologies. Second, improved agricultural technologies, such as climate-smart crop varieties, innovative irrigation systems (small and large), and soil carbon enhancing practices enabled by tractor use are becoming more widely available to Kenyan farmers. Third, digital and mobile technologies are providing a way for site-specific climate information and agro-advisory services to be tailored and delivered to farmers. Fourth, investment into climate-resilient innovations are also receiving increasing attention from investors, and innovative climate risk financing mechanisms are emerging.

**POLICY ACTIONS:**

1. **DEVELOP** Kenya’s long-term vision for climate change and agriculture and contribute to updating the agriculture component of Kenya’s Nationally Determined Contributions (NDCs).
2. **STRENGTHEN** the coordination of climate change issues in the agricultural sector.
3. **STRENGTHEN** acquisition and dissemination of climate data and information for enhanced advisories to farmers through extension services and ICTs.
4. **SUPPORT** research, technology development, innovation and application of climate risk management tools and smart management practices, such as Early Warning Systems (EWSs), climate-smart micro-lending, food security risk financing and agricultural insurance along with providing incentives for increased private sector participation.
5. **IMPROVE** a holistic and inclusive soil carbon, soil health and soil fertility alongside nutrient management mechanism/system that ensure realization of the full potential for increased productivity in contributing to food and nutrition security, adaptation and mitigation co-benefits.

**FIGURE 1. FIVE BUILDING BLOCKS TO CLIMATE CHANGE-RESILIENT AGRICULTURE**



*Source: Adapted from Global Commission on Adaptation; Loboguerrero, 2018 and customised to Kenyan Scenario*