



ROUNDTABLES DISCUSSIONS IN KENYA



CAPS ALLIANCE

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INTRODUCTION:

The following report provides a concise overview of a recent roundtable discussion convened to explore the scope and impact of climate change on Kenya. Held physically on 26th March 2024, the discussion brought together a diverse array of stakeholders, including, experts from academia, representatives from non-governmental organizations (NGOs), and Public Institutions.

The primary objective of the roundtable was to foster a deeper understanding of how climate change is affecting Kenya's diverse ecosystems, economy, and society. Through robust dialogue and exchange of insights, participants aimed to identify key challenges, explore innovative solutions, and formulate actionable recommendations for building resilience and mitigating the adverse effects of climate change.

The outcomes and recommendations generated from this collaborative dialogue are expected to inform future policy formulation, research endeavors, and community-based initiatives aimed at addressing the multifaceted challenges posed by climate change in Kenya. This report aims to distill the key insights and outcomes of the roundtable discussion, providing stakeholders of the CAPS Alliance Project with a valuable resource for advancing climate resilience and sustainable development initiatives in the country.

Key Topics Discussed:

- ❖ Q1: Changes in Agricultural Productivity
- ❖ Q2: Impacts of Climate change to Soil and Water Resources
- ❖ Q3: Impacts of Climate Change on Agrobiodiversity

KENYA'S CLIMATIC CONDITIONS:

The Republic of Kenya, located in East Africa, covers a total land area of 582,646 kilometers square (km²), which includes varied formations of plains, escarpments, and hills, as well as low and high mountains. Starting east along the coast, low plateaus run inland (west) to an elevated plateau and mountain ranges, marked by the Kenyan highlands in the southwest corner of the country. Kenya shares borders with Somalia to the East, Ethiopia to the north, South Sudan and Uganda to the northwest and west, and Tanzania to the south. The country's southeast coastline borders the Indian Ocean. Approximately 85% of Kenya's land area is classified as a fragile arid and semi-arid ecosystem, which is largely pastoral.



FIGURE 1: Kenyan Map

1. The country's highlands are home to the majority of the population and also host significant farm lands. Kenya's nature-based tourism industry is also a major land user, with wildlife protected areas covering 8.2% of the; and area. Protected land areas are also included as conservancies.
2. Highlands are relatively cool and agriculturally rich, and are largely dominated by commercial and small-holder farms. Principal cash crops include tea, coffee, flowers, vegetables, pyrethrum. Wheat and maize, as well as livestock production is also practiced across the highlands, which lie at 5,000 to 10,000 feet above sea level.
3. The Great Rift Valley bisects the highlands into an east and west region forming a steep sided trench 48 to 64 km wide and 600 to 900 m deep.

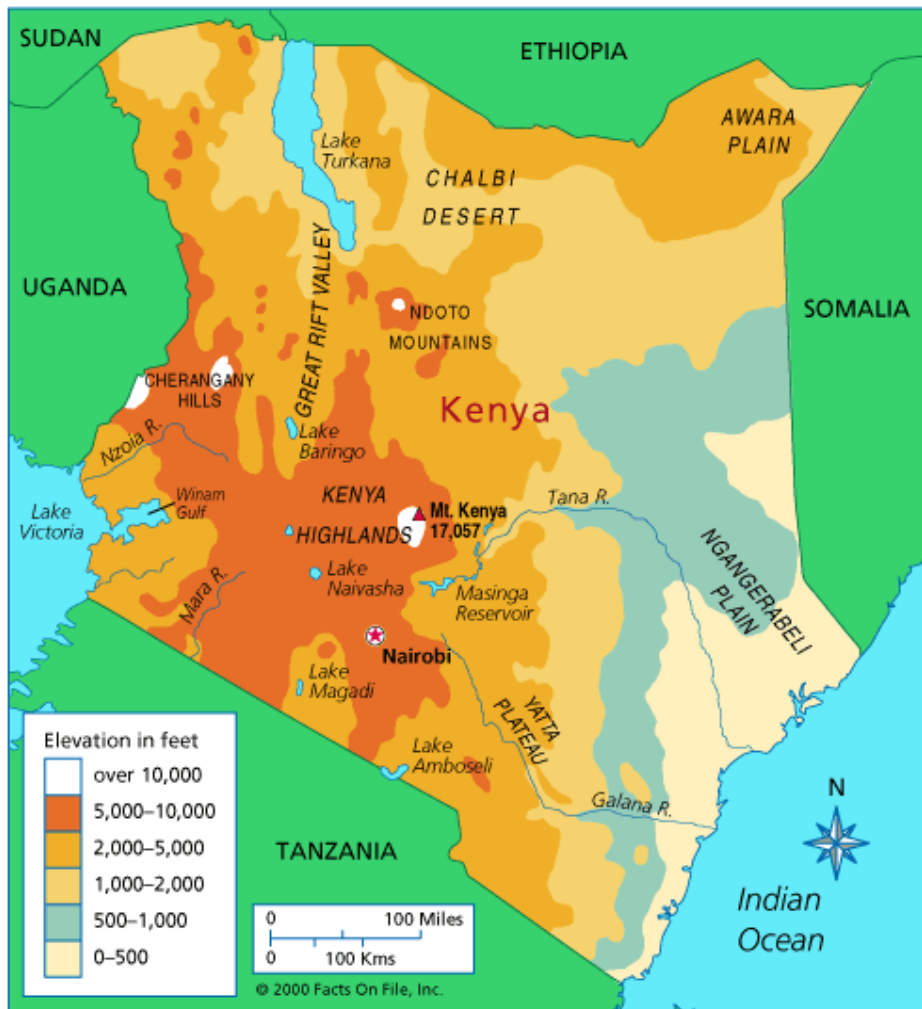


FIGURE 2: Kenya’s Climatic Conditions

Kenya, while considered a lower middle-income country, has the largest economy in East Africa. It has a population of 52.6 million people (2019) and an annual population growth rate at 2.3%. Approximately 27% of Kenya’s population currently lives in urban areas. This is projected to increase to 33% and 46% of the population by 2030 and 2050, respectively. Gross Domestic Product (GDP) in 2018 was US \$95.5 billion and the economic annual growth rate 5.4% (2019). Kenya has continued to implement significant economic and structural reforms, which have helped to sustain economic growth and political gains over the past decade. Key challenges continue to be seen in the country’s inequality and poverty levels, which has increased the country’s economic vulnerability to shocks.



TOPIC 1: Climate Changes in Agricultural Productivity:

Overview

The agricultural sector is critical to Kenya's economy and food security and is considered to be one of the most vulnerable to climate risks. The sector contributes approximately 28% of Kenya's GDP and accounts for more than 65% of exports, with crop, livestock, and fisheries sub-sectors contributing approximately 78%, 20% and 2% to the agricultural GDP, respectively. As of 2015, the agricultural sector provides about 80% of total employment and supports over 80% of the rural population. Four sub-sectors are recognized: crops, livestock, fisheries and forestry. The country's reliance on agriculture and dependence on imports (especially of wheat, maize, and rice, among others) underscores the need for sustainable, resilient increases in agricultural productivity for food security and economic growth.

Climate Change Impacts

Climate change poses a serious negative impact on agriculture-based livelihoods in Kenya, challenging the sustainability of current arable, pastoral and fishing practices. The majority of Kenyan agriculture relies on seasonal rains for production and the projected changes in precipitation patterns are expected to directly increase the likelihood of short-term crop failures and long-term production declines. Rain-fed agriculture remains the dominant source of staple food production and is the foundation of livelihoods for the majority of the rural poor in Kenya. The high inter-annual variability of precipitation is already having devastating consequences on rural livelihoods, with droughts and floods a frequent occurrence in both the arid and semi-arid lands and key agricultural zones. Additionally, indirect impacts, such as increased rates of runoff and soil erosion, and increased crop losses from wildlife migrations, rising and novel infestations from insects, diseases and weeds, could significantly magnify production losses.

Some regions of Kenya may see a benefit from a changing climate, specifically the temperate and tropical highlands, the Rift Valley and high plateaus, as projected increases in rainfall and slightly warmer temperatures are likely to raise crop yields. However, the country's large semi-arid and arid land areas are projected to see a significant decline in agricultural productivity and livestock numbers, as water resources become increasingly scarce. Given its exposure and sensitivity, the agriculture sector is one of the most vulnerable to climate change. Rising temperatures will likely alter the mix and

distribution of agriculture and livestock pests, while the increased incidence of droughts, coupled with reduced rainfall projections for the arid and semi-arid regions, is expected to reduce yields in key crops: maize, wheat, rice, livestock and fisheries. Key cash crops such as coffee and tea are also likely to be highly affected due to temperature increases as well as the increased presence of pests and diseases.

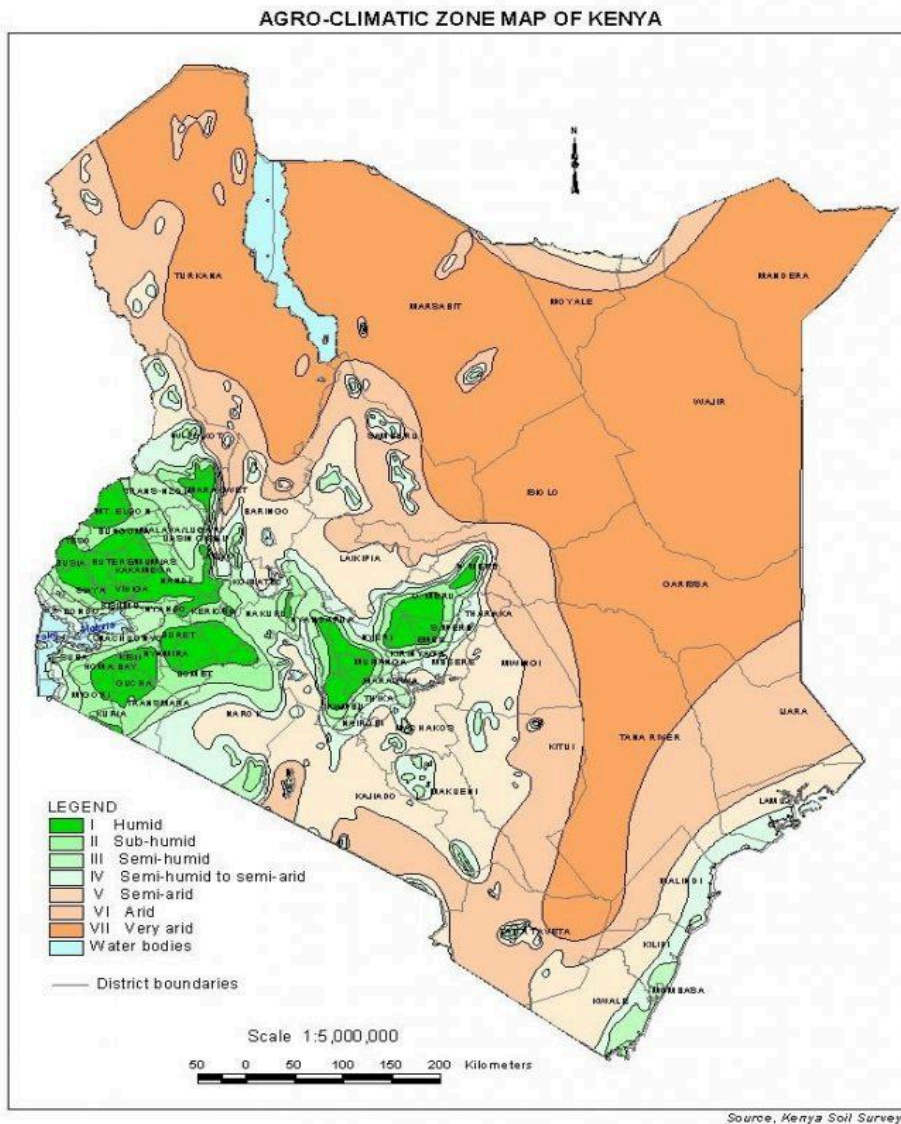


FIGURE 3: Kenya’s Agro-climatic Map



Roundtable Findings:

During the roundtable discussion focused on Kenya's agricultural sector, participants delved into the nuanced impacts of climate change on agricultural productivity, exploring various regions across the country.

Observations of Changes in Agricultural Productivity:

Participants noted significant variations in agricultural productivity across different regions of Kenya over the past decade. For example:

- In the arid and semi-arid lands (ASALs) such as Turkana and Garissa counties, prolonged droughts have led to drastic reductions in livestock numbers and crop failures, exacerbating food insecurity among pastoralist communities.
- Conversely, regions like the central highlands, including areas around Mount Kenya and the Aberdare ranges, have experienced shifts in rainfall patterns, affecting the timing and quantity of crop yields such as tea, coffee, and horticultural crops.

Effect of Climate Change on Crop Yields:

Participants discussed the impact of climate change-related factors on crop yields, highlighting specific examples:

- In the Rift Valley region, erratic rainfall patterns have disrupted maize production, a staple crop for many smallholder farmers. The prolonged dry spells have led to decreased yields and increased vulnerability to food insecurity.
- Coastal regions such as Kilifi and Kwale have faced challenges due to rising temperatures and saltwater intrusion, affecting rice cultivation and coconut farming, which are vital sources of income for coastal communities.

Adaptation Strategies Implemented by Farmers:

Participants shared examples of adaptation strategies adopted by farmers in different regions:

- Farmers in Machakos and Kitui counties, located in the eastern region, have embraced conservation agriculture techniques such as mulching and agroforestry to conserve soil moisture and enhance crop resilience during periods of water scarcity.



- In Nyeri and Meru counties in the central highlands, smallholder tea farmers have diversified their income streams by integrating beekeeping and eco-tourism initiatives, reducing their reliance on tea as the sole source of livelihood.

Resilient Crops and Agricultural Practices:

The discussion highlighted examples of resilient crops and agricultural practices adopted in various regions:

- In the Lake Victoria basin, farmers have embraced climate-smart agriculture practices such as integrated fish-farming and paddy rice cultivation, leveraging the region's water resources to enhance food security and income generation.

- Agro-pastoral communities in Narok and Kajiado counties have integrated drought-resistant forage crops like brachiaria grass into their livestock management systems, mitigating the impacts of pasture degradation and water scarcity.

Impact on Food Security and Livelihoods:

Participants emphasized the differential impact of changes in agricultural productivity on food security and livelihoods across regions:

- Urban and peri-urban areas such as Nairobi and Mombasa have faced challenges related to food affordability and access, particularly among low-income households, highlighting the interconnectedness between rural and urban food systems.

- Vulnerable communities in the northern frontier counties, including Marsabit and Mandera, have experienced heightened food insecurity due to climate-induced displacement, conflict, and limited access to markets and social services.

TOPIC 2: Climate Change Impacts on Soil and Water Resources:

Overview:

In 1992, Kenya was categorized as a water scarce country, as available water resources were calculated at 647 m³ per capita; below the international acceptable threshold of 1,000 m³. The country's water scarcity index has worsened alongside its rapid population growth, and is expected to fall from approximately 586 m³ per capita in 2010 to as low as 293 m³ per capita by 2050 (Republic of Kenya, 2013). Kenya is thus critically exposed to the adverse effects of climate change. This has serious implications for Kenya's Vision



2030 as these impacts will be detrimental to the country's tourism, agriculture, industry, and energy sectors. Freshwater resources in Kenya are already highly subject to the large inter-and intra-annual rainfall variability, including the extremes of floods and droughts.

Kenya's agricultural soils perform a large number of economic and environmental functions. Many industries, including farming and food production, forestry and tourism, depend on the sustainable use of soils. Research shows our soils are generally in poor state. Therefore, there is no room for complacency, and pressures on soils need to be taken seriously in order to check on the current state of soil degradation. The most significant of those pressures are climate change, soil erosion and loss of soil fertility. Whilst there are uncertainties as to how exactly the future climate will impact Kenya's soils, there is a risk that other threats like erosion, compaction, loss of biodiversity and nutrient leaching could be exacerbated. We need to prepare for these future challenges and enhance the soil's capacity to adapt to pressures under a changing climate.

Current State of Soil and Water Resources:

In the roundtable discussion, stakeholders addressed the current state of soil and water resources in Kenya, highlighting significant challenges exacerbated by climate change. The country faces water scarcity, with available resources falling below international thresholds. In Kenya, water scarcity has worsened over time due to rapid population growth, leading to increased pressure on limited water sources. Similarly, the Eastern and Northern Regions grapple with water scarcity issues, further compounded by erratic rainfall patterns and prolonged droughts. These challenges have severe implications for various sectors, including agriculture, industry, and livelihoods, underscoring the urgent need for sustainable management practices.

Challenges Identified by Stakeholders:

Stakeholders identified several challenges facing soil and water resources in both countries. These challenges include soil degradation, erosion, declining groundwater levels, and increasing water scarcity. For example, in the Northern parts of Kenya, soil erosion is a pressing issue, particularly in areas prone to heavy rainfall and flooding. In other parts of Kenya, declining groundwater levels pose threats to agriculture and livelihoods, affecting farmers' ability to irrigate crops and sustain food production.



Additionally, both regions experience conflicts over land and water rights, exacerbated by climate change impacts, further complicating resource management efforts.

Measures Discussed for Conservation and Resilience:

During the discussion, stakeholders emphasized the importance of implementing measures to conserve soil and water resources and enhance resilience to climate change. Examples of such measures include water resource management strategies, soil conservation practices, and the promotion of efficient water use. For instance, in Kenya, integrated soil fertility management practices are being promoted to enhance soil health and improve crop productivity. In Somalia, water resource management plans aim to address water scarcity issues and mitigate the impacts of climate variability on agriculture and livelihoods. These measures are crucial for building resilience and ensuring sustainable resource management in the face of climate change.

Regional Variations and Adaptation Efforts:

Stakeholders also discussed regional variations in the impacts of climate change on soil and water resources within Kenya. Coastal areas, such as Mombasa in Kenya, face unique challenges, including salinization and water scarcity due to sea-level rise. In arid and semi-arid regions, such as northeastern Kenya close to parts of Somalia, droughts and groundwater depletion are major concerns, affecting pastoralist livelihoods and exacerbating conflicts over resources. Adaptation efforts, such as large-scale irrigation projects and community-based water management initiatives, vary based on regional priorities and vulnerabilities.

Role of International Partnerships and Funding:

International partnerships and funding mechanisms were highlighted as essential for supporting sustainable soil and water management initiatives in Kenya. Collaboration with international organizations, donor agencies, and development partners provides technical expertise, financial resources, and capacity-building support. For example, partnerships with organizations like the United Nations Development Programme (UNDP) and the World Bank facilitate the implementation of adaptation projects and promote knowledge sharing on best practices. Additionally, funding mechanisms such as



climate finance and grants support community-led initiatives for soil and water conservation, contributing to resilience-building efforts at the local level.

TOPIC 3: Climate Change Impacts on Agrobiodiversity:

Overview:

In Kenya, there is a continuous unabated expansion of agriculture into natural habitats due to demographic and economic pressures posing a significant threat to biodiversity. Therefore, there is a need to study biodiversity loss and its regain through practices in agricultural landscapes. The fundamental component of biodiversity is agrobiodiversity since agriculture is the backbone of the Kenyan economy occupying over 70 % of the productive land. Different studies have shown the importance of agrobiodiversity in agriculture because each species has its role in the food chain while the nature of the agricultural environment is dependent on crop diversification. Agrobiodiversity is crucial for delivery of a wide range of agroecosystem services, which greatly enhances the quality of human life. However, human activities have adversely contributed to the loss of biodiversity, thus compromising ecosystem stability.

Discussion on Agrobiodiversity in Kenya: Impacts and Conservation

During our roundtable discussion, participants agreed on the significant changes observed in agrobiodiversity across Kenya, particularly in relation to climate change. The shifts in temperature and rainfall patterns have had profound effects on the distribution and abundance of crop varieties and wild plant species. For example, traditional crops like sorghum and millet, which are resilient to specific climatic conditions, are facing challenges due to changes in rainfall patterns. Conversely, crops like maize and beans, which are more sensitive to climate variations, are struggling to maintain stable yields in certain regions. These observations highlight the vulnerability of Kenya's agricultural systems to climate change and underscore the urgent need for conservation measures.

The implications of declining agrobiodiversity for food security, resilience, and adaptation to climate change were thoroughly discussed. With reduced crop diversity, farmers have fewer options to cope with environmental stresses such as droughts, floods, and pest outbreaks. This vulnerability is particularly evident in regions where



monoculture farming practices predominate, leading to increased risks of crop failures and food shortages. For instance, participants shared examples of areas heavily reliant on maize monocropping experiencing severe food shortages during periods of erratic rainfall, highlighting the urgent need for diversified agricultural systems.

Participants also recognized the crucial role of traditional farming practices in conserving agrobiodiversity in Kenya. Practices such as crop rotation, mixed cropping, and seed saving have been integral to maintaining diverse crop varieties and wild relatives for generations. For instance, indigenous farming communities in the Rift Valley region have long practiced intercropping of maize and beans, enhancing soil fertility and promoting biodiversity in agricultural landscapes. Similarly, pastoralist communities in arid and semi-arid areas have developed adaptive grazing strategies that support the coexistence of diverse plant species, contributing to ecosystem resilience.

To address the challenges and promote the conservation of agrobiodiversity, participants emphasized the importance of policy support and community engagement. Policymakers need to prioritize the protection of traditional farming practices and biodiversity-rich ecosystems through targeted interventions and incentives. Initiatives such as documenting and conserving traditional crop varieties, led by organizations like the Kenya Agricultural and Livestock Research Organization (KALRO), were highlighted as essential for safeguarding Kenya's agricultural heritage and enhancing resilience to climate change.

Furthermore, participants discussed the potential of integrating agroforestry and intercropping systems to enhance agrobiodiversity and resilience to climate change. By combining trees, shrubs, and crops in the same agricultural landscape, farmers can create diverse habitats that support a wide range of plant and animal species. For example, the adoption of agroforestry practices such as alley cropping and windbreak planting can help mitigate soil erosion, improve soil fertility, and provide additional sources of income for smallholder farmers.

However, participants acknowledged several policy gaps and barriers hindering the conservation and sustainable use of agrobiodiversity in Kenya. These include inadequate funding for biodiversity conservation programs, lack of awareness among policymakers about the importance of agrobiodiversity, and conflicting land-use policies. To address these challenges, participants emphasized the need for coordinated efforts from



government agencies, civil society organizations, research institutions, and local communities to develop and implement policies that promote the conservation and sustainable use of Kenya's rich agrobiodiversity heritage.

OTHER REFERENCES:

1. Republic of Kenya (2013). Sector plan for drought risk management and ending drought emergencies, Second medium-term plan: 2013–2017. URL: <https://www.ndma.go.ke/index.php/resource-center/send/43-ending-drought-emergencies/4271-edc-mediumterm-plan-2013-2017>
2. Kremen C, Iles A, Bacon CM. [Diversified farming systems: an agroecological, systems-based alternative to modern industrial agriculture](#). *Ecol Soc.* 2012;17(4):1–19.
3. Republic of Kenya (2013). The Crops Act, 2013. [The Agriculture, Fisheries and Food Authority Act. Kenya Gazette Supplement No. 28](#) (Acts No. 16). NAIROBI, 25th January, 2013.
4. Republic of Kenya (2010). [The Kenya CAADP Compact. Comprehensive African Agriculture Development Programme Framework](#). July 2010, Nairobi, Kenya.
5. Republic of Kenya (2013). [The Agriculture, Fisheries and Food Authority Act, 2013. The Agriculture, Fisheries and Food Authority Act. Kenya Gazette Supplement No. 25](#) (Acts No. 13). NAIROBI, 25th January, 2013.
6. WWAP (2006). World Water Assessment Programme (WWAP). Kenya national water development report (Report No. UN-WATER/WWAP/2006/12). [Report prepared for the 2nd UN World Water Development Report Water: A Shared Responsibility](#).