

Abstract

Climate change is a phenomenon that has major implications across our entire planet. One such nation within Africa bearing a significant brunt of the negative externalities of climate change is that of Kenya. Kenya, an equatorial country in East Africa, consists of a complex and variable climate ranging from warm and humid in the coastal regions to arid and very arid in the interior. Since 1960, Kenya has experienced a general warming trend, reported as being about 1°C, or 0.21°C per decade (Kenya NCCAP 2018-2022, 2018). Kenya is particularly vulnerable to the effects of climate change due to the fact that it relies on the very climate-sensitive economic sectors of agriculture, tourism, and energy for national income. These sectors depend upon reliable yearly climate patterns to operate effectively and provide livelihoods for Kenya citizens. Thus, using current literature and personal experience, this poster will address and evaluate the current options that available for Kenya concerning climate change prevention, mitigation, and adaptation.

Introduction

The threat of climate change is not untrodden news to Kenya. Even since it's early years as a nation, the country has been experiencing the effects of climate change. Global Climate Modelling (GCM) data indicates that, "the mean annual temperature is projected to increase by between 0.8 and 1.5°C by the 2030s and 1.6°C to 2.7°C by the 2060s" (Kenya NAP 2015-2030, 2016). Additionally, the country has experienced changes in their annual climate as rainfall patterns have begun to alter and the prevalence and severity of natural hazards has increased. The long rains of March, April, and May have become shorter and dryer, while the short rains of November have become longer and wetter. The overall annual rainfall has been steadily decreasing and the effects are widely acknowledged whenever drought strikes the nation, particularly in the arid/semi-arid regions. These troubles are only exacerbated by increased flooding in the rainy seasons. Torrential rains and severe flooding from March to May in 2018 devastated communities that were already struggling to recover from a prolonged drought. (Kenya Climate Change Directorate, 2019). These climate crises related to water and food also threaten political stability and can increase levels of conflict internally from within the country and externally with other countries. In addition, the environmental effects are staggering as climate change and global temperatures rising are known to produce ocean acidification, rising sea levels, desertification, forest degradation, overall loss of biodiversity, and so on. For Kenya, the culmination of these threats and concerns greatly undermine ability of the nation to reach the goals of Vision 2030 and the Sustainable Development Goals.

Methodology

Literature Review and Analysis of Kenya's current:

1. Participation in International Climate Agreements
2. Domestic climate change prevention plans
3. Sector-specific options for mitigating the effects of climate change
4. Domestic climate change adaptation plans



Figure 1. Mwea rice fields affected by drought from late rainy season



Figure 2. Community Action Plan meeting in Meru County

Results

- International Climate Agreements
 - United Nations Framework Convention on Climate Change (UNFCCC), Africa's African Climate Change Strategy (2011), East Africa's Climate Change Policy, Strategy and Master Plan (2011), the Kyoto Protocol (2005), the Paris Agreement (2016), The Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants (2012), the Montreal Protocol (1988), the 2030 Agenda for Sustainable Development Goals, and many other climate-related fights
- Domestic Climate Change prevention, mitigation, and adaptation measures and goals
 - Article 42 of the Constitution of Kenya (2010), National Climate Change Action Plan (NCCAP) 2013-2017, 2018-2022, National Adaptation Plan (NAP Kenya), Kenya Climate Change Directorate
- Kenya's Nationally Determined Contribution (NDC) submitted to UNFCCC is to abate its greenhouse gas emissions by 30% by 2030, relative to the business as usual scenario of 143 million tons of carbon dioxide.
 - Actual reduction in GHG emissions of 42.9 million tons. To meet this target, the NCCAP 2018-2022 has divided the emission reduction by sector
- The number one adaptation approach that must be invoked to ensure success in all other methods is to build local community power and capacity building through the use of participatory practices.

Prevention and Mitigation

Sector	Prevention and Mitigation Measures
Forestry	<ul style="list-style-type: none"> • Forestry operations - reforestation, improved plantation management • Timber conversion • Sustainable charcoal production and consumption
Energy	<ul style="list-style-type: none"> • Increases in prevalence and research on renewable energy sources - geothermal, solar, wind, and hydropower • Current practices in Olkaria, Turkana, and Ngong Hills can be replicated
Transportation	<ul style="list-style-type: none"> • Mombasa-Nairobi Standard Gauge Railway (SGR) • Invest in improved public transport systems
Agriculture	<ul style="list-style-type: none"> • Livestock and manure management • Promote soil conservation and carbon sequestration to increase storage of carbon and reduce loss of stored carbon • Energy conservation and fuel switching
Industrial	<ul style="list-style-type: none"> • Industries such as iron and steel, cement, chemical, and aluminum manufacturing are primary contributors to climate change due to their inherent requirement for large amounts of energy • Research and creation of new technologies to make the industrial processes more sustainable • Policy interventions to assure that climate concerned changes are actually implemented.
Waste	<ul style="list-style-type: none"> • Individual waste reduction • Cultural and Structural Shifts

Chart 1. Kenya's Emission Reduction Potential (NCCAP 2018-2022) and the NDC Targets by Sector (MtCO₂e per year)

Sector	Total Emissions (MtCO ₂ e)	Emission Reductions Relative to Baseline (MtCO ₂ e)				
		High range*	Low range*	Technical Potential	NDC Target	
	2030	2030	2030	2022	2030	2030
Forestry	22	20.1	11.3	10.4	20.8	20.10
Electricity Generation	41	12.6	7.5	9.2	9.2	9.32
Energy Demand	10	-	-	7.1	7.1	6.09
Transportation	21	3.5	2.0	1.8	4.7	3.46
Agriculture	39	2.8	1.6	2.61	5.17	2.77
Industrial Processes	6	1.3	1.0	0.45	1.08	0.78
Waste	4	0.4	0.4	0.72	0.82	0.39
Total	143	40.1	23.8	32.28	48.87	42.9

Adaptation

For Kenya to address climate change properly requires addressing the basic needs of people and strengthening assets to create climate resilient communities. The primary way to build resilience is through capital accumulation

- Human capital (education and know-how)
 - Enhanced education systems and assuring access to secondary education and beyond for all youth
 - Training young Kenyans in relevant careers and imparting new skills to those already in the workforce or unemployed in order to increase the number of beneficial, fair-paying job opportunities
 - Support of innovation and development of new climate technologies
- Natural capital (fertile soils, water, etc)
 - Climate-resilient sustainable land management including: research and introduction of drought-resistant crops, increasing crop diversity to protect overall yields against natural hazards, the promotion of new food habits, conservation agriculture and agroforestry, integrated soil fertility management, and water harvesting for crop production (Troni et al, 2018)
 - Promotion of public awareness on water conservation
- Physical capital (infrastructure)
 - Improved transport sector (see Discussion section)
 - Climate proofing of roads, railways, buildings, and aviation through appropriate designs and materials in order to protect against climate related hazards

Conclusions

Overall, it is indisputable that climate change is affecting all corners of our earth, Kenya included. As a country that relies heavily on agriculture, tourism, and energy for national income, the people of Kenya are particularly vulnerable to the effects of climate change. In order to preserve and strengthen the political, social, and economic stability of the country, it is necessary that Kenya enacts measures to prevent, mitigate, and adapt to climate change. This will require that Kenya to follow through on current mitigation and adaptation proposals, plans, and commitments within the country and around the world and well as that research and develop further climate change actions and technologies to continue in this fight against our changing world.

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