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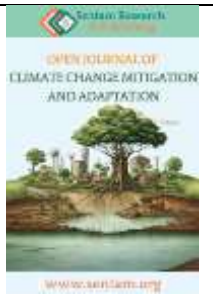

Climate Change in East Africa. A Layman's Perspective on the Effects of Climate Change in East Africa

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ABSTRACT

This paper examines climate change impacts in East Africa through the lived experiences of ordinary people, with a particular focus on Kenya. Africa emerges as the most vulnerable continent to climate change despite contributing minimally to its causes. The vulnerability stems from societies' heavy dependence on rainfall for agriculture, the complex and understudied nature of African climate systems, the magnitude of projected climate changes, and limited adaptive capacity at both individual and governmental levels. The authors present a layman's perspective, drawing from personal observations spanning several decades. They document how traditional seasonal patterns, long wet season (April-June), cool dry season (July-September), short wet season (October-December), and warm dry season (January-March), have become increasingly erratic and unpredictable. This disruption has severely affected smallholder farmers and pastoralists who have relied on these patterns for generations to guide planting, harvesting, and livestock management decisions. The paper provides extensive documentation of climate-induced disasters in Kenya from 1971 to 2020, including devastating droughts, floods, and landslides. Notable events include the 2011 drought that affected 3.75 million people, declared a national disaster, and the 2020 flooding that caused Lake Victoria to exceed its 56-year record water level, displacing over 200,000 people. The research highlights how drought-stricken areas like Narok, Makueni, and Tana River paradoxically experience destructive floods when rains return, creating a cycle of disaster. Beyond food insecurity, climate change has exacerbated regional conflicts, particularly cattle rustling among pastoral communities competing for scarce resources. The authors critique both meteorological departments for failing to provide accurate forecasts and communities for not heeding warnings when issued. They emphasize that mitigation and adaptation efforts have been largely reactive rather than preventive, relying heavily on humanitarian aid that has become habitual for certain regions. The paper concludes with a call for collective global responsibility, sustainable mitigation measures, improved forecasting capacity, and a fundamental culture change to address this man-induced crisis.

Keywords: Climate change, East Africa, drought, floods, food insecurity, adaptation capacity, smallholder farmers, climate disasters

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INTRODUCTION

Climate change is a global concern that has prompted many scientists and scholars in general to write intensively on the subject. One common undisputable finding by such scholars is that Africa is the most venerable region as far as the weather changing patterns in the world is concerned. It is the most hit continent in spite of the fact that it has not contributed much, as research suggests, to the causes of global climate change. Consequently, Africa has always been perceived as a key driver to the mitigation and adaptation efforts to climate change. The ravaging extent of climate change in Kenya resemblances the experiences recorded in other countries of East Africa. At the tip of the iceberg, Senaratna et al. (2013) note that Kenya is among the top 11 most vulnerable countries in Africa to the risks of disaster-induced poverty which drought and floods being the most prevalent and devastating.

Richard Washington, a climate specialist explains that the African continent is the most disadvantaged because of the following reasons:

> First, African society is very closely coupled with the climate system; hundreds of millions of people depend on rainfall to grow their food.
>
> Second, the African climate system is controlled by an extremely complex mix of large-scale weather systems, many from distant parts of the planet and, in comparison with almost all other inhabited regions, is vastly understudied. It is, therefore, capable of all sorts of surprises.
>
> Third, the degree of expected climate change is large. The two most extensive land-based end-of-century projected decreases in rainfall other over southern Africa
>
> Finally, the capacity for adaptation to climate change is to reduced choice at the individual level while governance generally fails to prioritise and act on climate change.

The World Food Programme (WFP, 2020) echoes the observations by Washington noting that climate change has been and remains the most devastating conflicting and major drivers for hunger in Kenya and the world over. Climatic shocks stemming from storms, drought and floods are increasingly causing immense and unexpected destruction of food production systems exacerbating the calls for humanitarian support and related aids. The natural disasters today play a major role of disrupting not only food production system but also incurring an insurmountable disruption of the lives of people through displacements, destruction of property, livelihoods besides food and resulting in many injuries and deaths (UNDP, 2007). The most worrisome of the consequences have been attributed to the hinged ability of communities to recover nor be resilient from ever happening climatic changes.

This paper shall expose the ordinary person's experience in Kenya as a case of East Africa in general. The two writers are both from Kenya, one from Western and the other from Rift Valley regions which are intensively affected by the weather changing patterns. The other regions of Kenya too, like the Northern part have been experiencing a great upheaval which in part is a blessing and on the other disaster and misery.

We shall discuss how the ordinary people perceive, understand or do not understand the climate change phenomena and how it impacts on them now and in the future. We shall also show the impact of these climate changes on the ordinary people view and what these changes mean for them with a keen focus on episodes of drought and flooding which are far more prevalent in Kenya and many other regions of East Africa. Finally, we shall discuss whether the ordinary people and citizens of East Africa or their governments have the capacity to deal with this phenomenon.

The Layman's Perspective

The challenges in climate change have been experienced for the last twenty or so years in East Africa. Indeed, the discussions on global climate change have managed to attract some serious attention even among African scholars but not as much as it would be expected when correlated to the extent and graveness of climate change.

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Climate change is no longer an abstract phenomenon but from it may be perceived so, based on the perpetual cases of a disaster affecting people in the same regions and localities over time. It would be expected that if an area is categorised as flooding prone, the number of causalities and implications should reduce over the years, but this has not been the case for Kenya as exemplified in subsequent discussions.

One of the writers of this chapter is approaching seventy years and what is happening is what he has never seen in his life. Those who are older also confess that some of the changes in climate have not been witnessed for the last one hundred years more so the threshold and habituality of the disasters. The effects of climate change have crept in slowly and the majority of the people did not take any notice while some sadly still live in denial. Indeed, when there was drastic weather change it was assumed that it was temporary and that things will return to normal sooner than later. For example, when asked about weather changes, the majority of people remember the heavy rains that fell in 1961, as well as the hunger of 1994, referred among the Luhya's of western Kenya as '*Sava lulala'* hunger [wash your hands once; many families could afford only one meal a day (FWCC, 2020)] but after the disasters which everything come back to normal.

The awareness of the climate change phenomenon in Kenya was highlighted when the government forced people out of the Mau forest on the account that the drought was brought about by the destruction of forest and water catchment area. As the masses of the poor people who had lived in the Mau Forest were removed by force, the weather pattern did not change as expected, in fact, the erratic weather patterns have become the order of the day. Many areas started to experience drought, unpredicted rainfall in non-traditional seasons.

In fact, there was a great drought that caused many rivers to dry up and the Rift Valley lakes were shrinking and drying up. But even before the trees and vegetation grew significantly to warrant a change of weather, it started raining such that all the major rivers and lakes across Kenya have flooded causing havoc crops and livestock and the people who live around. These changes particularly affected the farmers who depended on the weather to grow the crops and to ensure adequate food for the livestock.

African Societies Depend on Rainfall

As suggested by Washington above, the communities of East African heavily depend on rainfall patterns that have guided them for many years. In particular, a normal year is divided into four seasons thus: Long wet Season – April to June; cool dry season – July to September; Short wet Season – October to December and warm dry season – January to March. (Washington)

This pattern of seasons was so regular for many decades in East African that when recently the March rains delayed and also cut short, it surprised the scientists who described the new trend as "East Africa paradox". This was the case in 2017 and 2018 when March rains started late in Kenya and Tanzania and at the same time, the rains were cut short. This trend was seen to be unique by scientists who expected and predicted wetter seasons over the same season. Surprisingly, the paradox has not lasted long since in the year 2019 and 2020; the pattern has changed has not maintained the expected "paradox" pattern. Instead of beginning from the cool dry season of 2019, it has not stopped raining to date, that is July 2020 as we write this paper. And surprisingly this might not end now since there are signs that the rains may persist for the rest of the year.

Since the seasons have been so regular and predictive, the communities understood them as periods of planting, weeding, harvesting and ploughing, indeed these seasons governed their activities throughout the year. This meant that the livelihood of the majority of the local farmers in East African depended on these seasons to grow their crops and to graze their livestock. With climate change, this pattern has been disrupted in such a way that farmers are confused. Today more than ever, the months of December has been receiving heavy rains that were accustomed in the months of April to June.

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Regardless, many farmers have remained obedient to the normative traditional weather patterns tor many planting and harvesting decisions. People have failed to understand this phenomenon, and as a result the food production has decreased and has created many loses. The increasing non-dependence on the normative traditional climate and weather patterns have also been blamed to the metrological departments, which has equally failed to predict the changing patterns and advise the farmers and the people accordingly.

The implication of the changing rainfall patterns can further be exemplified by the arid and semi-arid areas, which even though they do not receive much rainfall. They have always depended in the traditional weather patterns to make a decision as well as obtaining water from nearby rivers and digging of wells. Disappearance or rather an absence of rainfall as anticipated hampers the production and livelihood systems of these areas more than any other part of a country. Ojwang', Agatsiva and Situma (2010) debunked climate variability and its implication in Narok and Laikipia districts of Kenya. The two districts are in parts of the drylands of Kenya but characterised with extensive agricultural activities. They note smallholder farming and pastoral livestock production in these areas and in these districts are the dominant activities but inevitably dependent on the availability of rainfall. Therefore, when droughts befall the areas, there is an immense reduction of the smallholder activities leading to increased food insecurity and loss of livelihood culminating with a call for humanitarian support. Ojwang' et al. (2010) notes that the abnormal onset of rainy seasons besides the droughts have also resulted in severe consequences where abrupt floods have destroyed crop fields, hampered physical mobility by the destruction of infrastructures, increase in disease epidemics and general severity impacts on the livelihoods of people. *Table 1* below by Ojwang' et al. (2010) can depict the change of weather patterns in Narok and Laikipia, which is the case of many other dryland areas across Kenya.

Table 1: Chronological trend of rainfall patterns in two dryland districts of Kenya

Year	Laikipia District	Narok District
2009	Drought (severe), millipedes' infestation	Drought (severe), F&D, Anthrax, diseases
2008	Drought, millipedes in highlands	Drought (mild)
2007	Drought (mild), millipede invasion	Drought (mild)
2006	Drought	-
2005	-	Drought
2004	Drought	Drought (mild)
2003	Drought	-
2002	-	Drought (mild)
2001	Drought	Drought
2000	Drought (severe)	Drought (severe)
1999	Drought	Drought

Source: (Ojwang' et al., 2010)

The Surprises of Climate Change

The surprises of climate change are now a puzzle to many scientists to the smallholder farmers. It has been projected that in Kenya, temperatures will rise up to 2.5 C between 2000 and 2050.FN Similarly, rains fall shall be more intense and less predictable. The slightest change is expected to distrust the growing season and bring about challenges in food security. Currently, these changes are evident. In the last two decades, Kenya has been hummed with a series of disasters due to climate change among them heavy rains, drought, landslides, the recent occurrence of snow in Nyahururu, and the rising sea levels and lakes (Lake Victoria has experienced 3 meters rise) among others. Ojwang' et al. (2010) paints a picture of disasters and their implications in Kenya from 1971 to 2008.

The above events by Ojwang' et al. are not conclusive of all the events, the number of climatic disasters has further increased from 2011 to date. In 2011, part of the Rift Valley, Northern and eastern Kenya was at the verge of starvation. According to Red Cross Kenya, by July 2011, over 3.75 million Kenya residing in 13 districts across Kenya were at the verge of death by

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starvation. The level of hunger was so immense in that the Kenyan Government was left no choice but to declare the hunger a national disaster (Red Cross Kenya, 2012). The drought was declared by the United Nations as the worst ever to hit the Horn of Africa in 60 decades where more than 12 million people inclusive of 2 million children in Ethiopia, Kenya, Somali and Djibouti require humanitarian support. In order to salvage the situation in Kenya, public support was support under the umbrella of Kenyans for Kenya initiatives that realised donations of over US$ 6 million (600 million Kenyan Shillings) in cash and other foodstuffs and personal effects to other to support and help the people hit by hunger (African Grantmakers Network, 2013). This was the best ever sense of public philanthropy ever recorded in Kenya and Africa it over 250,000 Kenyans and corporation took part in the alleviating the so grave hunger hitting the country in 2011. Nonetheless, subsequent years have never fallen short of climatic disasters.

Table 2: Trend of Climatic Disasters and People Affected in Kenya from 1971-2010

Year	Type of Disaster	Area of Coverage	People affected
2007/2008	Drought	Widespread	9 000 000
2007	Floods	Khuvasali, Kakamega	98
2004/2005	Floods	Budalangi, Nyando	34 000
2003	Floods	Budalangi	28 000
2002	Landslides	Meru, Murang' a, Nandi	2 000
1999/2000	Drought	Widespread	4.4 million
1997/98	El Niño floods	Widespread	1.5 million
1995/96	Drought	ASAL zone	1.41 million
1991/92	Drought	ASAL zone	1.5 million
1985	Floods	Nyando/Western	10 000
1983/84	Drought	Widespread	200 000
1982	Floods	Nyando	4 000
1980	Drought	Widespread	40 000
1977	Drought	Widespread	20 000

Source: (Ojwang' et al., 2010)

From 2011 to date, Kenya and other regions of East Africa have been experiencing extensive and continued episodes of consequences of climate change. While over 3.5 million Kenyans were being traumatised by hunger in 2011, many others across the country were being displaced by floods while others were skilled. In 2011, over 9,761 households were displaced by floods in West Kenya with Busia and Siaya recording the highest cases (IRC & DREF, 2012). About 1,800 households were displaced in the coast region; 247 in North Rift; 2,687 in South Rift and other regions of Upper Eastern while 550 were displaced in North Eastern and Central Kenya (IRC & DREF, 2012). The statistics show that West Kenya, South Rift and Upper Easter as well as the Coast of Kenya are the most prone to floods.

The severity of floods and drought, as well as some cases of landslides, have progressed to rock Kenya like never before. A review of any year shows an increased exacerbation of climatic change disaster. Shows the implications of drought, floods, and landslides denote the extent of climate change. The government of Kenya in January 2014 declared an impending drought expected to affect about 1.6 million people. There was a failure of long rains between March and May 2014 is the ASAL zones. Across the year, there was a large increment of food insecurity with an increase from 1.3 million people in February 2014 to 1,6 million by August 2014 (Reliefweb, 2020). The most affected populations were residents of the North and northeastern Kenya as well as some parts of the North Rift. The severity of drought in this area continued to 2015 with may people being vulnerable to food insecurity than ever. Between Aug 2015 and March 2016, the of Kenyans facing food insecurity due to drought doubled from 600,000 people to about 1.25 million Kenyans between August 2016 and Feb 2017 (Reliefweb, 2020).

In 2018, the cases of food insecurities induced by drought increased to 3.4 million people with about half a million people experiencing severe difficult to access water (Reliefweb, 2020). The primary goal of looking at these statistics is to show the

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extent of drought-induced food insecurity. The number of these causes of food insecurity and ever-expanding drought have become the order the day. Daily and yearly, the call of humanitarian support for drought victims is ever-expanding at an unprecedented rate. The drought has been accustomed to specific regions which have become default like. Worryingly, drought cases are expanding to other areas that were relatively better off and sustainable.

Climate change consequences in regard to drought continue to have impacted not only on the food security but outflows to insecurities such as cattle rustling and related fights as communities fight for scarce pastures for their livestock. Cases of cattle rustling among the Karamoja region in Uganda from Pokot and Turkana herders of Kenya as well as between the Turkana and Pokot has been exacerbated by drought. Gumba (2018) reports that due to increasing drought, cases of cattle rustling nabe equally worsened. For instance, on February 12, 2018, the Chadian militia attacked a neighbouring community in Sudan's West Darfur region killing 7 people and stealing 500 heads of cattle. The same month, over 500 people were murdered while 10,850 heads of sheep, cattle and goats stolen from three sperate classes between the Dinka tribes of South Sudan and the Misseriya group of Sudan. Noteworthy, the rustling has been there for a while, but the magnitude and frequency of the cases have been worsened by a devastating drought. In a study to monitor and help pastoralists in Tanzania, Kenya and Ethiopia, a mobile phone application was created where the pastoralists using the app reported 48% mortality of their livestock due to devastating drought. The obvious remedy for many pastoralists is invading neighbouring communities stealing their cattle to compensate for their loss. Therefore, climate change consequences have increase conflicts among communities have ever.

For the last three years, 2018-2019, Kenya has experienced perturbing rates of floods and landslides with some affecting areas never classified as flood-prone zones. Some regions have been struck by floods due to heavy rains in distant locations. While some regions in Kenya were experiencing the consequences of lack of rainfall, others were cursing the ravaging implications. By March 20 2018, regions of Central Kenya, Eastern and Nyanza experienced heavy rains that lead to the death of 15 people while over 1,000 were evacuated in Makueni counties alone (Reliefweb, 2018). From March 2018 to end of April 2018, more than 211,000 and 72 people were reported to have been displaced and killed respectively while 33 other injured due to floods across Kenya. Over 8,350 acres of croplands were destroyed, at least 6,000 livestock killed, houses properties and infrastructure damaged by floods. Over 150 and 310,000 people were killed and displaced respectively across 40 counties in Kenya. Over 28% of the crop in Turkan were destroyed while over 100,00 cares of cropland damaged in Tana River, 12,355 acres in Kitui, Makueni, and Meru, 1,507 acres in Taita Taveta, 200 in Narok and over 4,500 cares in Kilifi county. Interesting some of these regions experience severe droughts such as Narok, Makueni, Tana River and Wajir. When rains despair is the despair of hunger while hen they come back, instead of rejoicing, the rains are cursed.

The impacts of the floods due to heavy rains were experienced in 2019 and 2020. By November 2019, over 120 people were killed by landslides in Kenya where 72 people were reported to have been killed after their houses being buried by landslides in West Pokot county alone. By December 2019, it was reported that over 17,000 people were displaced while 132 others killed by floods and landslides (Reliefweb, 2019). In April 2020, a village and market centre that has been in existence for evert 8 decades was flattened by flash floods and landslides. The rain was falling in the mountains but not the village, the villagers least expected the rains as they continued with their daily activities only to be hit by floods and landslides with no warning. The floods and landslides were devastating leaving four people dead, 18 injured over 4,000 displaced and 24 other missing (Kibor, 2020). The heavy rains experienced across the country more so West

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Kenya and the Rift Valley and other regions of Tanzania and Uganda saw Lake Victoria breaks the 56 years of the highest water level. On May 5, 964, the water level of the lake rose to 13.41 meters by on Thursday, May 2020; the level reached 13.42 m rise. The raise resulted in the displacement of over 200,000 people in Kenya and Uganda (Raballa, 2020). The shows the extent of worsening effects of climate change within Kenya and across its borders. The cases discussed in this section are but a few of the total cases recorded between January and May 2020. The impacts of the changes are much worse at the national and regional level.

Mitigation and Adaptation Capacity

Kenya and the global community have been concerned about the worsening implication of climate recognising the need for more sustainable measures to mitigate and adapt to the changes. As opposed to other regions that experience severe earthquakes, hurricanes, extreme heatwaves such as the case of Australia and cyclones, climatic changes in Kenya and East African, as well as most parts of African, have been limited to floods, landslides and drought. The coherence and precedence of these disasters have been largely blamed to the inability of the weatherman to accurately predict them and issue a warning at an advance time. Most of the measure to the disasters have been reactive such as humanitarian help that has become habitual and default foe some regions. The severity of drought and floods can be mitigated and adapted to when people are informed in advanced. Governments, NGOs and as the people in the disaster-prone areas can be educated enough on how to respond to the disasters. For instance, in case of floods and drought, the people are being relocated in advance to secure and safe places provided with food and necessary measures. Disaster prevention and management department should put in place preventive measures as opposed to reactive measures to the best of capacity. Metrological resources and forecasting capacity should be improved so as to make a dependable and accurate prediction to help the people. Equally, there is a culture of ignorance of forecasts from metrological departments by people for being unreliable. This culture is problematic because even when the weatherman is correct, people assume they are wrong until the disaster strikes. Sadly, these disasters have also continued to affect areas over time with almost the same level of severity; there is a need for more sustainable alternatives.

CONCLUSION

Climate change is a man-induced problem that can be solved by us, but only when we universally accept global warming is not an abstract phenomenon, and we collectively make it our mission to save the planet. As much as the global community continues to demand sustainable mitigation and adaption measures, our money-driven inconsiderate desires have clouded our actual capacity to mitigate the problem. People say one thing and do the another; we create forums and organisations to mitigate climate change but end up propagating it. We need a culture change not only of planting free for reforestation and afforestation but mothering the trees to grow. Stopping the unprecedented encroachment into forests, accountability of greenhouse gas emissions. Global warming is not static as per the laws of physics; thus, it is only through collective unconditional responsibility that this planet we claim to love can ever be saved. Failure, nature will treat and teach us right through the hard way.

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