

Why Droughts Continue to Hit the People in the Ikanga-Kyatune Ward Hard

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ABSTRACT

For long, droughts have continued to be rated to bring the most risk to the people of the semi-arid Ikanga/Kyatune ward area of Kitui County, Kenya. The resultant effects are manifested in disruptions in water supply, food availability and significant economic losses. This study was set to find out how people live in drought, its frequency, severity and existing and potential measures to alleviate the associated challenges. Focus group discussions using structured questionnaires were employed to guide the debate that brought together 90 household heads and local opinion leaders, and 10 key informants drawn from policy implementers and livelihoods extension personnel from the government and non-governmental organizations. The obtained data was subjected to descriptive statistics. The overall finding was that individuals and households continue to suffer heightened vulnerability to drought as a result of a combination of factors that compound in social, economic, environmental and political conditions. The genesis of the challenge was found to be the absence of proactive and sustainable drought planning and taking of mitigation strategies which leaves individuals and households highly vulnerable. The situation is aggravated by lack of adequate infrastructures, population growth and climate change which puts pressure on the limited and fragile resources. The study recommends community and stakeholders embracement of appropriate and sustainable planning and monitoring on droughts, and onboarding mitigation measures as part of measures to reduce the bites of the two weather calamities.

Keywords: Vulnerability; stakeholders; mitigation strategies; sustainable; drought planning.

Article Info

Received:
14 April 2026

Accepted:
26 May 2026

Available Online:
10 June 2026

1.0 Introduction

Climate variability, population rise, land tenure and use changes and, upswing in poverty have lowered the adaptive capacity to drought for people living in the Kyatune-Ikanga Ward. The area faces unprecedented

drought episodes, which have seen increased frequency and severity in recent years. Table 1 shows the historical occurrences of drought in the area and the resultant consequences. The 2020–2022 drought was the most severe and prolonged, with extensive livelihood losses and significant detriments to access to water, food

security, income, health and education. Some households had to migrate in search of solace. The negative effects to the psychological and emotional well-being of the people still lingers in the milieu as full recovery is yet to be achieved, reinforcing the concerns of the complexity and wide-ranging effects of drought on people. The drought resultant ecological disruptions, hydrological imbalances, and atmospheric changes are interconnected and reinforce each other. Understanding the multifaceted impacts of drought is therefore essential for crafting effective strategies to mitigate the effects and build more resilient ecosystems in the face of a changing climate. The aspect invites proactive measures to safeguard both the environment and human good fortunes in the face of increasingly severe and prolonged droughts. Implementing sustainable water management practices and promoting conservation and restoration efforts are vouched for as crucial. Recognizing drought as not just a temporary inconvenience, but as a powerful environmental force, is the first crucial step in fostering a healthier, more sustainable future. The need for comprehensive and integrated approaches that consider all the varied ingredients and implications of drought cannot be overstated. This study was set to build an understating on why the people are hard hit by drought with each coming of the season. Understanding the multifaceted impacts of drought is crucial for implementing effective mitigation and adaptation strategies.

2.0 Study Methodology

2.1 Study Setting

The Ikanga/Kyatune Ward lies to the South of Kitui County in Kenya. The climate is characterized by savannah grassland with few trees planted at the homesteads. In some areas ground cover comprises short shrubs and wood trees of acacia species and poor grassland indicating soil erosion. The area faces heavy land degradation largely due to human activities.

The hydrology of the Ikanga /Kyatune ward is dominated by the two seasonal rivers of Tiva and River Nzeeu and their tributaries. The waters of the two rivers largely drain into the Tsavo Game reserve. Harvesting of the water while flowing in the Ikanga-kyatune ward is manifested in seasonal wells. The area becomes dry immediately after the rain stops, pushing the water table down, making it hard for the plant to access water.

Annual malnutrition rates are on the rise in the Ikanga-kyatune Ward with an average of 80 children malnutrition cases being referred to health centers for assistance (Community Health Promoters (CHP), 2025, personal communications). Insecurity, livelihoods and asset thefts, drug and substance abuse and other anti-social behaviors are on the rise, all being blamed on high prevailing poverty levels. Illegal businesses such as buying and selling of scrap metals have heightened loss of people's property. The youths have become averse to agriculture and moved to urban centers in search of employment away from land use, leaving behind the aged, people living with disability and women at homes who have little capacity to address climate change.

The awareness about the negative impact of climate change is generally growing in the Ikanga-kyatune Ward. Many people have already witnessed the change in the climate and its consequences on their lives, livelihood and the environment. The area Climate Change Planning Group has the vision of reducing vulnerability of the inhabitant communities and achieving sustainable development as an essential part of adaptation. It is the first line of defense against climate change impacts, such as increased flooding or recurring droughts. The community has formed a Residence Champions team to marshal efforts from within and without on matters of drought management to build adaptation measures that are sustainable.

2.2 Study Design

Ten focus group discussions consisting of agro pastoral farmers, opinion shapers, youth and women representative government and non-governmental organizations were held. A guiding questionnaire was employed to trigger open-ended conversations that could yield qualitative data on "why" and "how" drought affects and impacts on them in format. The approach was geared towards exploring issues from multiple perspectives within the targeted population and building of consensus.

A total of 100 people participated in the focus group discussions. The selected individuals possessed intimate knowledge of the local history, culture, and unique challenges that the community faces. 10 key informants were involved as individuals with specialized knowledge or deep insights about drought in the Ikanga/Kyatune ward and the local community.

3.0 Results and Discussion

3.1 The Drought Effects Space

The study shows that the Ikanga-Kyatune Ward people become vulnerable to drought due to a combination of factors, including their socio-economic status, dependency on rain-fed agriculture, limited access to resources, and the presence of weak governance structures. 95% of the people repute poverty and inequality as a source of vulnerability to drought. People living in poverty are more vulnerable because they have fewer resources to cope with drought impacts, such as food shortages, water scarcity, and job losses. The community's heavy reliance on rain-fed agriculture is interpreted by 97% of the people to make the Ikanga-kyatune population particularly susceptible to droughts, as crop and livestock productivity failure lead to food insecurity and economic hardship. Lack of access to clean water, sanitation, and healthcare can exacerbate the impacts of drought, leading to health problems and displacement as reported by 86% of the people. Over 75% of the people feel that weak social networks and a lack of community support hinders people's ability to cope with drought-related challenges. People are becoming more and more individualistic. 65% of the discussion participants air out that women and children often bear the brunt of drought impacts, facing increased workloads, limited access to resources, and higher risks of malnutrition and disease. Weak governance is blamed by 72% of the people to heighten vulnerability to drought. Ineffective governance, corruption, and lack of investment in drought-resilient infrastructure is found to hinder the community's ability to prepare for and respond to drought events.

Deforestation, overgrazing, and unsustainable agricultural practices is found by over 60% of the people to lead to soil erosion and reduced water availability, making communities more vulnerable to drought. According to 85% of the respondents, climate change, with its increasing frequency and intensity of drought events, poses a significant threat to vulnerable communities. The Kyatune-Ikanga area has limited water resources, raising the vulnerability of the people to drought situations. Less than 30% of the people have access to safe drinking water. Water shortages lead to conflicts and economic hardship.

Droughts disproportionately impact people in the Ikanga-kyatune Ward, aggravated by the fact that the region is

already water-scarce, making the inhabitants highly vulnerable to water shortages and the associated consequences like crop failure, livestock loss, and increased poverty. People with chronic medical conditions, those with lower incomes, infants and children, and older adults are most vulnerable to drought health impacts. Drought is the most worrying problem in the Kyatune-Ikanga Ward region. Analysis of droughts occurring in the region show that between the 1970 to 2006 the number of droughts more than doubled. The droughts have many unique identifiers that distinguish them from other natural hazards. They are a creeping phenomenon whose onset and end are difficult to determine with precision. The residual effects of droughts linger for a considerable period after the event's end. The absence of a standard definition of drought adds to the confusion regarding its recognition, classification, and the measure of its severity. Drought impacts are usually non-structural and spread over more expansive geographical space, mostly crossing frontiers uninvited.

Drought experiences show that they result in significant impacts regardless of the prevailing social and economic development levels of the inhabitant households and individuals, resulting in water and food insecurity, land degradation, agricultural losses, human migration, and conflicts. However, the character of the impact differs profoundly. Drought affects the vulnerable most because the social and economic support systems cannot withstand its effects, and the people have limited options and inadequate coping strategies during times of water and forage shortage. Majority of the droughts that have occurred in the Kyatune-Ikanga Ward have largely resulted in loss of livestock, malnutrition, dropping out of school and migration. Added, have been issues of moral decay and marital challenges. The 1980s were characterized by aspects that defined their own peculiarities such as the provision of the yellow maize from America (*yua ya katongelele*). The 1984 drought was unique in that though people had money, there was no food to buy, hence baptized *Nikwa ngwete*. The consequent drought of 1986 saw people surviving on wheat flour (*yua ya mikate*) as they had to make dough from wheat flour which was baked directly on fire.

This non-structural nature of drought has hindered the development of an accurate, timely, and reliable assessment of its severity, geographical magnitude, and ultimately the formulation of sound contingency plans by the government and its development partners. On the other hand, there is confusion in the scientific and policy

community about the character and manifestation of drought. At some level, drought management is primarily a policy question where the government and other stakeholders are seen to have knee jack reactions as opposed to prescribed proactive measures in policy. Until the status of drought policy and preparedness are fully crystalized, proactive and effective drought management will remain a hit-and-miss endeavor

3.2 Impacts of Droughts

Droughts in the Kyatune-Ikanga often emerge slowly making the damage it causes being gradual. 98% of the people of interviewees observed that drought does not typically damage person's private property in the same way that other natural disasters such as floods do, which reduces public concern about responding to drought. Due to this, drought in Ikanga/Kyatune ward 'kills people slowly'. It affects first the most vulnerable families and individuals who largely comprise the aged, people living with disabilities, children and women. Table 2 shows some social effects of drought in the area households. The drought-social impacts have families being disintegrated, with women leaving their husbands and running away with their kids due to lack of food, fees and other important and basic items in the family. This interrupts the learning processes of the school going children as the number of dropouts rise up while school girls engage themselves into early marriages and unwanted pregnancies. School attendance decrease caused by inconsistencies in school meal provision. The disruption of livelihoods affects households, making some parents unable to afford school fees. The incidence of child labor rise further contributing to school dropouts. A primary school class in the ward that had 12 learners in the beginning of the year and the number dropped to 5 within a month in the drought period of two years.

3.3 Impacts on Agriculture

Farmers are most affected during the time of drought because of the depletion of water availability in soils which causes significant declines in crops and livestock productivity, which is reported by over 80% of the study participants (Table 3). The situation is up hilld by livestock death (70%), livestock diseases (53%) and lessened market strength. In addition, surface and groundwater supplies may decline during drought, affecting water availability and increasing costs to access water for crop or forage irrigation and watering livestock. Falls of armyworm infestation and maize are lethal

necrosis disease affect maize production in Ikanga-kyatune Ward. Fall armyworms thrive in drought conditions. The infestation began affecting maize-farming in 2017 and has been very destructive.

3.4 Impact on Health

Table 4 gives a breakdown of the impact of drought on people's health. Malnutrition ranks the highest (73%). Being a farming community, absence of water means a lack of crops on farms and income from sale of farm produce. Absence of food is indicated by 48% of the people to lead to mental health problems. Droughts lead to poor water quality, increased risk of waterborne diseases, and malnutrition, all of which negatively impact public health. The Kyatune-Ikanga Ward experience water shortages after failed rainy seasons. Water pans, dams, wells, and boreholes have dried up. The average trekking distance to functional water sources increase by as much as 5km. Because of limited access to safe water and unhygienic practices like open defecation, waterborne diseases such as acute watery diarrhea, are at a higher risk of spreading. Malnutrition worsens as drought drive food insecurity, water shortages, and diseases. Droughts lead to decreased water quantity and quality, increased incidence of illness or disease, and adverse mental health outcomes as livelihoods are challenged. During drought conditions, fuels for wildfire, such as grasses and trees, can dry out and become more flammable. Without food aid or support from governments or aid organizations, long periods of drought end in famine.

3.5 Hydrological Impacts of Drought

Drought's hydrological impacts are perhaps the most obvious, affecting water sources and water cycles in profound ways. The changes can have long-lasting effects on the landscape and water resources. 57% of the discussants found prolonged periods of low rainfall leading to decreased streamflow and 75% experienced reduced river and groundwater levels which impact the ecological health of aquatic ecosystems, as well as water availability for human and livestock use (Table 5). Wetlands and ponds are especially vulnerable to drought, drying up and shrinking significantly. This loss of habitat has a devastating impact on the species that depend on these water bodies. Reduced precipitation leads to less water infiltrating the ground, causing water tables to drop. This makes accessing groundwater more difficult and expensive, and it can impact ecosystems that depend

on groundwater discharge. If the groundwater table drops too low, wells run dry, leaving communities without access to potable water, leading to water shortages and conflict over remaining resources. Reduced water flow in rivers and streams can lead to an increase in the concentration of salts and other dissolved substances, which can harm aquatic life and render water unsuitable for human consumption as reported by 54% of the Kyatune-Ikanga Ward residents. Lower water levels concentrate pollutants, leading to increased pollution levels in water bodies. This poses health risks to both humans, livestock and wildlife.

3.6 Atmospheric Impacts of Drought

Drought impacts on the atmosphere contribute to environmental degradation and exacerbates the effects of climate change (Table 6). More than a half of the people reckon that droughts negatively affect the atmospheric water, leading to wind erosion (53%), degraded air quality (50%) and reduced moisture recycling (64%). As drought desiccates landscapes, the soil becomes loose and vulnerable to wind erosion. This leads to an increase in dust storms, which can carry fine particles over long distances. Dust storms significantly degrade air quality, posing health risks to humans and animals, particularly respiratory ailments. Dust particles can influence atmospheric processes by reflecting or absorbing solar radiation and altering cloud formation, with complex and potentially unpredictable effects on climate patterns. Healthy vegetation releases water vapor into the atmosphere through evapotranspiration. During drought, this process is reduced, resulting in less moisture recycling and potentially exacerbating dryness and localized warming. Cognizance is the changes in atmospheric moisture can influence rainfall patterns, potentially leading to shifts in precipitation patterns in both drought-affected and distant regions. Drying soils release stored carbon dioxide into the atmosphere, further contributing to climate change. The

3.7 Ecological Impacts of Drought

Drought conditions create a cascade of negative effects on ecosystems, impacting everything from the smallest microbes to the largest mammals (Table 7). These changes often trigger a domino effect, altering the balance of nature in significant ways. One of the most visible impacts of drought is its effect on vegetation. Plants, which form the foundation of the ecosystems, are particularly vulnerable. Reduced water availability leads

to decreased growth, leaf shedding, and ultimately, plant mortality. This loss of vegetation has multiple ramifications. As vegetation becomes scarce, herbivores face starvation and population declines, which subsequently affects their predators. Droughts lead to increased soil erosion. Plant cover helps bind soil together, preventing erosion. Withering vegetation leaves soil exposed, making it more susceptible to wind and water erosion, which can further degrade the land. Shifts in plant communities can alter the entire structure of an ecosystem, favoring drought-tolerant species over others.

This can lead to a loss of biodiversity and less resilient landscapes. Dried vegetation becomes highly flammable, greatly increasing the risk of wildfires. The fires, exacerbated by drought, can cause widespread habitat destruction, release massive amounts of carbon into the atmosphere, and further degrade soil quality.

3.8 Impact on Population Groups

a) Female-headed households: As male household heads and young men migrate with livestock to seek water and pasture or, move to urban areas in search of alternative livelihoods, women are increasingly left in charge of households. The situation, which is reported by 56% of the discussion participants places pressure on women to provide for their families while facing the scarcity of resources resulting from drought. Women have to walk longer distances than usual to access essential supplies, such as food and water, exposing them to the risks. In some instances, hunger causes them to resort to negative coping mechanisms, such as transactional sex.

b) Children: 80% of group discussion participants indicate that the livelihood disruptions caused by drought increases instances of child labour. Opinion thrives that some boys drop out of school to engage in income-generating activities, like motor-bike taxis (*bodaboda*). 63% of the discussants associate some children with engagement in criminal activities, such as drugs and abuse substances peddling, to earn an income. There are higher numbers of early marriages incidences for girls that is used as a coping strategy. Girls are also exposed to the risk of sexual assaults when they travel longer than usual distances in search of food and water.

c) Displacement: 20% of the people are linked to moving away from the Ikanga-kyatune Ward in search of better land to farm for a sustained food supply and economic benefits.

Table.1 Historical Perspective of Droughts in the Kyatune-Ikanga Ward

Drought Year		Characteristics of the Drought
1.	1974-1975	mass livestock death, malnutrition, school dropouts.
2.	1981	famine, massive livestock death, malnutrition, school dropouts
3.	1984	famine (<i>yua ya katongelele</i>) livestock death, malnutrition, school dropouts.
4.	1985	famine (<i>Nikwa ngwete</i>), moral decline, livestock death, malnutrition
5.	1986	famine (<i>yua ya mikate</i>), massive livestock death <i>disintegration</i> of families,
6.	2004/2005	Severe drought, livestock death
7.	2007/2008	Severe drought, livestock death
8.	2016/2017	Severe drought, crop failure, reduced animal yield,
9.	2020-2022	Severe drought, crop failure, reduced animal yield,

Source: Ikanga/Kyatune Ward Climate Change Planning Group (2025).

Table.2 Social Impacts of Drought

Impact		[N=[100]
1.	Family Disintegration	52
2.	Schooling Disruption	68
3.	Early Marriages	36
4.	Prostitution	50
5.	Early Pregnancies	44

Table.3 Impacts on Agriculture Productivity

Impact		[N=[100]
1.	Low Crop Yields	87
2.	Low Livestock Yields	80
3.	Plant Invader Species	62
4.	Livestock Diseases	53
5.	Livestock Death	70
6.	Low Market Values	50

Table.4 Impact on Health

Impact		[N=]
1.	Waterborne Diseases	70
2.	Water washed Diseases	66
3.	Malnutrition	73
4.	Mental Health	48

Table.5 Impacts on Hydrology

Impact		[N=[100]
1.	Decreased Streamflow	57
2.	Decreased Groundwater Access	75
3.	Conflicts	50
4.	Quality Deterioration	54

Table.6 Impacts on atmospheric water

Impact		[N=100]
1.	Wind Erosion	53
2.	Degraded Air Quality	50
3.	Reduced Moisture Recycling	64

Table.7 Ecological Impacts of Drought

Impact		[N=100]
1.	Decreased Plants Growth	85
2.	Leaf Shedding	91
3.	Plant Mortality	88
4.	Increased Soil Erosion	75
5.	Less Resilient Landscapes	71
6.	Risk of Wildfires	80

Table.8 Vulnerability Causes

Cause		[N=(100)]
1.	Absence of Planning for Drought	96
2.	Marginalization	74
3.	Poor Infrastructures	88
4.	Weak Land-use Practices	66
5.	Inadequate Fallbacks	78

Table.9 Drivers of Vulnerability to Drought

Cause		[N={100}]
1.	Dependence on Rainfall	95
2.	Reduced Crop Yields	76
3.	Food Insecurity	80
4.	Biodiversity Loss	60
5.	Poverty Levels	90
6.	Falling Social Insurance	94
7.	Low Market Access	86
8.	Inadequate Infrastructures	50

4.0 Drivers of Vulnerability to Drought

Table 8 shows that in the Kyatune-Ikanga Ward there exists a general lack of preparedness for drought at the household level. Inhabitants store grass and plants remnants in trees as a ritual and not necessarily to take of drought. The high level of socioeconomic vulnerability in the Kyatune- Ikanga Ward is linked to decades of marginalization. This marginalization manifests as

political underrepresentation and exclusion from socioeconomic activities. Several groups in the local community have always had minimal representation in decision-making and at the administrative level. On the other hand, the government has under prioritized the region, denying it development in terms of infrastructure, services, and economic opportunities. Socioeconomic vulnerabilities and marginalization are evident, especially in northern Kenya. The area has a poor

infrastructure and inadequate access to sanitation and health services. The study region lacks adequate infrastructure, such as irrigation systems and water storage facilities, and may have limited coping mechanisms to deal with drought conditions. Climate change is exacerbating drought conditions making the area even more vulnerable. Cognizance is the social and economic costs of the droughts have not been well quantified. The occurrence of droughts causes considerable losses, part of the reason being on how planning and interventions are conceptualized. Traditionally, drought is viewed as a one-off disaster that requires an emergency response focused on a few short-term activities like delivery of food aid and other life-saving humanitarian support, rehabilitation of boreholes and, emergency vaccination campaigns.

Table 9 shows that droughts disrupt the crucial weather cycle, leading to water scarcity and crop failures, causing significant livestock deaths and economic losses. The people are vulnerable to drought because of their dependence on rainfall for water and agriculture. The resultant effects of reduced crop yields and livestock production, and environmental stress, amounting to food insecurity. The resultant economic impact includes job losses, reduced income, exacerbated poverty and inequality. Droughts lead to desertification, soil erosion, and loss of biodiversity, further impacting the livelihoods of people in these areas. Human activities directly trigger exacerbating factors such as over farming, excessive irrigation, deforestation, and erosion adversely impact the ability of the land to capture and hold water.

Droughts usually have a crippling effect on agriculture and tend to increase people and livelihoods vulnerability. Common results are of below-average harvests, diminished crop, pasture, livestock deaths, and lower milk production with negative social and economic impacts. Decreased income levels deplete household purchasing power and worsened food insecurity. Additionally, droughts lead to increased competition for scarce resources, potentially leading to conflict between communities that at times experience loss of human lives and livelihoods, displacement of peoples, disruptions in access to markets and of education of children.

Sand dams are identified to be an essential infrastructure that can be used to fight droughts. The Kyatune-Ikanga Ward houses about 22 sand dams, with only a third in operation. All the dams are silted-up, revealing inadequacies in planning, design and construction. The structures are found constructed in inappropriate sites

and not conforming to sand dams construction requirements. The implication of this is that the water resources are not able to meet their objective, the major one being to supply water in both wet and dry seasons.

5.0 Linking Drought to Actions

5.1 Planning for Drought

About 95% of the respondents indicate that their drought mitigation efforts have been largely reactionary and have had little to influence preparedness for future droughts. This is largely attributed to weak institutional capacities, bottlenecks in plans and policy development, and a weak drought warning system. Mostly, interest in drought contingency planning wanes in the post-drought phase as soon as precipitation moves to normal or slightly to above normal, whereas drought preparedness planning should be an integral part of development planning and the institutional structures necessary should be in place. 80% of the drought conversation participants were of the opinion that as residents, they should be the first to take action to reduce their vulnerability to drought. At the heart of the community, the power of local action in drought response that is tailored to the local context and partnering with other actors' interventions can resolve drought action problems. Capacity building and promotion of community participation and empowerment are realized to be key to sustainability of actions. About 78% of the people in the Kyatune-Ikanga Ward prescribe a shift from crisis to risk management, with 39% recommending use of seasonal rivers as the most viable long-term strategy for preparing for drought. However, 61% cite lack of knowledge on best practices to harvest and conserve water through use of sand and sub-surface dams or protected wells along the ephemeral rivers.

The study found that about 10% of the residents in the Kyatune-Ikanga Ward depend on social arrangements to survive and recover from droughts by depending on relatives and friends for support. 3% of the people particularly go for loans from women groups, and 28% chase government interventions to support their households in drought distress through mobile cash transfer. The process of cash disbursement to the selected beneficiaries involves a diversity of stakeholders from the local government and county officials to community and village heads and the community members themselves to give vulnerable families immediate options to take care of their most urgent needs that include food, water, education, health, energy, transportation, and

communication. However, 50% of the respondents flout the arrangement of corruption and unsustainability measures.

5.2 Anticipatory Actions

The use of anticipatory action is still a new concept among stakeholders in drought management and response. The stakeholders prefer crisis response and reactive approaches to climate-induced disasters. The National Drought Contingency Fund (DCF) managed by NDMA is an anticipatory action intervention which provides flexible funding for pre-agreed drought contingency plans at the county level. The funds for anticipatory action are not always available when needed and are released after situations have deteriorated. For example, the response to the 2021-22 drought in several counties in Kenya came after several people lost lives and the situation worsened, despite an early warning from FEWS NET.

5.3 Embracement of Livelihoods Diversification

33% of the droughts debate group members reported to have diversified their livelihood bases to take care of drought situations such as in seeking salaried employments away from home. 45% of interviewees indicate that farmers have shifted from subsistence farming to improved methods of growing crops which are failing in the harsh climatic conditions. Certified seeds are not doing well under the local short rains module. Failure to plant drought tolerant crops have raised vulnerability spheres, lowering household food security. People living with disability, aged, children and women are most vulnerable to drought as they are left at homes.

5.4 Having Responsive Drought Warning Systems

Wide gaps exist between meteorology and hydrology and between hydrology and humanitarian need in most drought-affected counties in Kenya. The aspect is indicated to need to galvanize real-time planning that could potentially prevent drought from turning into a crisis, with the weather forecasting providing informative and operational data that characterize the development of a drought. 65% of the respondents vouch for a robust system of indicators that can identify and diagnose anomalies and provide the basis for early detection of

drought events is the basis of any drought management plan, with operational data used as indicators to trigger specific actions. Operational variables can be linked with activities in the drought plan. The indicator systems are envisaged to allow early warning of drought events and time to establish and activate measures for emergencies. Local or indigenous weather condition indicators can also be integrated to complement other scientific indicators. The current drought management system remains centralized and lacks ownership, resources, and technology at the county level. Opinion leaders and extension personnel agree that although county government drought management plans exist, they largely contain pre-prepared off-the-shelf projects whose implementation is triggered by the early warning systems, but without sustainable funding for their execution.

5.5 Crops and Livestock Insurance Programmes

Less than 10% of the research participants were found to have engaged in insurances against drought. This is despite the fact that crops and livestock are a valuable resource for communities living in the area. The losses of the two during drought periods impacts negatively on the people's welfare. Several insurance plans have been put in place in Kenya's ASALs to reduce these risks. On livestock, the insurance programmes include Kenya Livestock Insurance Programme (KLIP), Index-Based Livestock Insurance (IBLI), and livestock insurance programmes by Old Mutual and Takaful insurance companies. However, cultural beliefs curtail the uptake of livestock insurance among pastoralists.

15% of the study participants view insurance as a Western concept that does not align with their traditional way of life.

They may prefer to rely on traditional coping mechanisms, such as selling or trading livestock during times of hardship, rather than paying premiums for insurance. Additionally, some pastoralists believe that insurance goes against their religious beliefs.

5.6 Reducing Drought Risk through Land Restoration

Over 80% of the study cluster feel that the power of local action in drought response provides useful means to success of posterity. In their opinion, partnering with

local actors, interventions can be tailored to the local context, promoting community participation and empowerment. The approach has potential to yield nature-based solutions which can reduce drought risks. Such an approach to drought management should be centered on at reviving hydrological functions through rehabilitation and sustainable land management to reduce the severity of drought. It should also be anchored on restoring biodiversity to foster adaptation and diversification. Land restoration and conservation of water catchments will restore hydrological processes and reduce the overall frequency and severity of drought. In some places, lack of rain is compensated by access to underground water, artificial reservoirs or moisture stored in soils across watersheds. As such, programmes oriented towards land restoration and sustainable water management are important for the long-term recovery of the ecosystem.

The development of strategic water sources for sustainable rangeland utilization is indicated by about 75% of the respondents to be key to drought mitigation in the semi-arid areas. Small-scale strategic water resources like subsurface dams, sand-dams, water pans and limited duration boreholes that can be closed during certain periods and adjusted to the seasonal availability of adjacent pastures, are critical in boosting herd survival during drought and should be a key priority in drought mitigation.

6.0 Conclusion and Recommendations

The absence of proactive drought planning and mitigation strategies leaves households in semi-arid regions highly vulnerable to the severe impacts of drought. Without preparation, the inhabitant communities face significant challenges related to water scarcity, food insecurity, economic instability, and potential displacement. To cushion households against the effects of drought, is it prudent to embrace appropriate effective, and action planning strategies

characterized by climate variability adaptive measures action oriented planning for drought measures. Effective planning involves measures like establishing early warning systems, implementing water conservation techniques, diversifying livelihoods, and creating emergency response funds, all of which can significantly mitigate these negative outcomes. Early warning systems can be improved by integrating more localized and contextual data into the drought management by strengthening data collection and analysis at all levels. Stakeholders need to work towards improving the local capacity of people in preparing, living in drought periods and recovering from droughts. Being a community bent on agro pastoralism, climate-smart land use is called for that is designed for the semi-arid environment. Capacity building is of essence to be able to have diversified sustainable diversification, focus being laid on adding value to local resources. Its goal need be to facilitate learning for positive change informed by continuous gathering of information.

6.1 Conflict of Interest

The authors declare no competing interests.

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How to cite this article:

Mwangi, M., Wambua, S. and Kisengese, J. M. (2026). Why Droughts Continue to Hit the People in the Ikanga-Kyatune Ward Hard. *Int.J.Curr.Microbiol.App.Sci*. Special Issue-12: 161-170.

doi: <https://doi.org/10.20546/ijcmas.2026.sp12.015>