REPUBLIC OF KENYA **GOVERNMENT OF MAKUENI COUNTY**

Makueni County Climate Change Action Plan

2023 – 2027

FOREWORD

As I reflect upon the journey we have undertaken in the development of the Makueni County Climate Change Action Plan (MCCCAP), I am filled with a profound sense of gratitude and admiration for the collective efforts that have brought us to this moment. The creation of this plan marks a significant milestone in our commitment to address the urgent challenge of climate change and secure a sustainable future for the people of Makueni County. Climate change is an undeniable reality that affects every aspect of our lives. It affects our environment, our economy, and most importantly, the well-being of our communities. Recognizing the gravity of this situation, we embarked on an ambitious endeavor to develop a comprehensive and inclusive Climate change action plan to achieve the needs and aspirations of our people of Makueni county.

The foundation of the (MCCCAP) lies in the County Participatory Climate Risk Assessment (PCRA) Report, which served as a guiding light throughout the planning process. The report results from the valuable insights, experiences, and perspectives shared by the diverse stakeholders who participated in this endeavor. Their knowledge and wisdom have shaped the very fabric of this plan, ensuring that it is rooted in the realities of our local context. This plan is not a mere document; it is a testament to our resilience, innovation, and unwavering commitment to securing a sustainable future for the generations to come. It outlines a bold path forward, one that will empower us to mitigate the impacts of climate change and adapt to its unavoidable consequences. It is a roadmap that will guide us in our efforts to build climate resilience, protect our natural resources, and foster sustainable development in Makueni County.

I am immensely proud of the collaborative spirit and unwavering dedication that has brought us to this juncture. The development of this Climate Action Plan is a testament to the power of collective action and the belief that together, we can overcome any challenge. Let us seize this opportunity to lead by example, to inspire others, and to create a future that is sustainable, inclusive, and prosperous for all. I extend my heartfelt appreciation to all the individuals and organizations who have contributed to this remarkable endeavor. Your commitment, expertise, and unwavering support have been instrumental in shaping this plan. I also express my gratitude to the technical team, who worked tirelessly to synthesize the inputs and transform them into a comprehensive roadmap for action.

I urge every citizen of Makueni County to embrace this Climate Action Plan as our shared responsibility. Let us work together, with a sense of urgency and purpose, to turn the tide of climate

change and build a future that is resilient, vibrant, and sustainable. The time for action is now, and our success depends on the choices we make today. Together, let us forge ahead on this transformative journey, knowing that our efforts today will shape the destiny of future generations. The MCCAPP is not just a vision; it is a call to action, an embodiment of our collective determination to safeguard our planet and ensure a prosperous future for all.

Mutula Kilonzo JNR, CBS

H.E the Governor

ACKNOWLEDGEMENT

The 2023-27 County Climate Change Action Plan has been prepared in compliance with the provisions of the guidelines set out by the National Treasury. The preparation of the CCCAP was a collaborative effort among various Government Departments, Agencies, Community and development stakeholders.

My sincere gratitude goes to the almighty God for provision of good health, wisdom and knowledge to carry out the process successfully. I acknowledge the various teams that tirelessly and sacrificially worked day and night to ensure the achievement of this very important process throughout the County within the provided timelines. I express our gratitude to the leadership and policy direction of H.E the Governor, H.E the Deputy Governor, the County Secretary, the County Executive Committee Members, Chief Officers, County Directors and other county technical staff for their support and inputs.

Special appreciation goes to the County Executive Committee for Lands, Urban Development, Environment and Climate Change for provisions of strategic direction and approval of various engagement activities that led to the development of the final Makueni County Action Plan. I appreciate the climate change unit for spearheading in preparation of the County Climate Change Action Plan and the Climate Change Fund Board for budget approval as well as the multi-sectoral climate stakeholder umbrella, the Ward Climate Change Planning Committees (WCCPCs) and the community representation that participated in the development of this Climate Change Action Plan.

I am specially indebted to Jackline Kamusa (Ag Climate Change Director), Jonathan Ngayai (Director Meteorological Services), Ajelicah Mulwa (Climate Change Liaison Officer), Christopher Mutunga (Climate Change Officer/M&E Officer), Richard Mwendwa Peter (Economist/Budget Officer), Kelvin Mutua (Environment Social Safeguard) officer), Joshua Mutua (GIS expert), Brian Kiio Muendo (Environment Officer), Catherine Mbinya (Environment Officer), Julius Mwangangi Mutia , Madeleine Mbatha (M&E Officer) and Tom Ndolo (Environment Officer), Nicodemus Kivindyo (Environment Officer), Elizabeth Nguku (Environment Officer), and Cynthia Muthiani (Environment Officer).

Finally, I express my sincere gratitude to Sector Working Groups (SWGs) and County and National Government technical officers for their invaluable contribution and input to the document.

Dr. Sonnia Nzilani Musyoka

CECM – Lands, Urban Planning & Development, Environment and Climate Change

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ACRONYMS

ASALs	Arid and Semi- Arid
CIDP	County Integrated Development Plan
GHG	Green House Gases
ISFM	Integrated soil and fertility management
KPHC	Kenya Population and Housing Census
LH	Lower High
LLITNs	Long Lasting Insecticides Treatment Nets
LM	Lower Middle
MTCT	Mother to Child Transmission
MTP	Medium Term Plan
NCCAP	National Climate Change Action Plan
NDC	National Development Contribution
NEMA	National Environment Management Authority
PCRA	Participatory Climate Risk Assessment
PMTCT	Prevention of Mother to Child Transmission
PWDs	People with Disability
SEKEB	South Eastern Kenya Block
SDG	Sustainable Development Goals
UM	Upper Middle

DEFINITION OF TERMS

Climate Change	Change in the climate system that is caused by significant changes in the concentration of greenhouse gasses due to human activities, and which is in addition to the natural Climate Change that has been observed during a considerable period.
Adaptation	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
Adaptive capacity	Ability of systems, institutions, humans, and other organisms to adjust to potential damage, take advantage of opportunities, or respond to consequences.
Global warming	Observed or projected gradual increase in global surface temperature. It is one of the consequences of Climate Change.
Greenhouse gasses	Gasses that absorb and emit radiant energy within the thermal infrared range. The main GHGs measured in a GHG inventory are, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), per-fluorocarbons (PFCs), hydro-fluorocarbons(HFCs), sculpture hexafluoride (SF6) and nitrogen tri-fluoride (NF3).
Mitigation	Human interventions to prevent or slow down atmospheric GHG concentrations by limiting current or future emissions, and/or enhancing potential sinks for greenhouse gasses.
Resilience	Capacity of social, economic and environmental systems to cope with a hazardous event, trend, or disturbance.
Vulnerability	Propensity or predisposition to be adversely affected. It encompasses sensitivity or susceptibility to harm, and lack of capacity to cope and adapt.

EXECUTIVE SUMMARY

Climate change actions in the County are guided by the National Climate Change Act 2016 and the Makueni County Climate Change Act 2022, which provides a framework for mainstreaming climate change across sectors. The Makueni County Climate Change Act 2022 mandates the County Executive Committee Member in-charge of Climate Change matters to formulate a five-year County Climate Change Action Plan (CCCAP) that addresses relevant sectors of county economy and provides mechanisms for mainstreaming climate change into all sectors and the County Integrated Development Plan (CIDP). The action plan is developed in line with the National County Climate Change Action Plan.

The Makueni County Climate Change Action Plan 2023-2027 provides Makueni climate context and associated risks and hazards, strategic Interventions and County climate action priorities. The plan provides a platform for resource mobilization and multi stakeholder approach for implementation of climate actions in the County.

The report reflects the outcome of the Participatory Climate Risk Assessment (PCRA) and County Climate Action Process in the 30 wards across the County. It takes into consideration output from community engagement, stakeholder and multi stakeholder engagement, County Executive, County Assembly and the review from County and National

The County Climate Change Action Plan outlines the governance structures for climate action in the County. The structures include; County Assembly, County Climate Change Steering Committee, County Climate Change Fund Management Fund Board, County Climate Change Planning Committee, County Climate Change Unit and the Ward Climate Change Planning Committees. The institutions mentioned above provide an avenue for integrating Community Based organization, Civil Society Organizations, Non- Governmental Organizations and National Government Agencies.

The plan includes an implementation matrix which provides priority actions in resolving water scarcity, environmental degradation, low agriculture, crop and livestock productivity, Energy, pollution, human-wildlife conflict and human diseases. It sets out the key performance indicators, responsibilities and source of funding. The implementation matrix provides an engagement framework with stakeholders for collective and integrated implementation of climate actions in the County.

This Action Plan will enhance climate resilience for local communities in the County by providing an enabling environment for partnerships, good climate governance, funding mechanism and investment framework to support effective implementation of the climate actions.

CHAPTER ONE: MAKUENI COUNTY OVERVIEW

1.1 Introduction and Background

Makueni County is one of the 47 Counties in Kenya. The County has an average population density of 186 persons. The County is divided into six sub-counties which are further subdivided into 30 electoral wards. Makueni County is a member of the South Eastern Kenya Block (SEKEB). Makueni County is situated in the South Eastern part of the country Bordering Machakos to the North, Kitui to the East, Taita Taveta to the South and Kajiado to the West. The County lies between Latitude 1º 35´ and 3° 00´ South and Longitude 37º10´ and 38º30´ East with an area of 8,176.7 KM2.

The County population is 987,653 consisting of 489,691 males, 497,942 females and 20 inter-sex. Majority of the population in Makueni are young people age 0-14 years (34.9%) and 15-24 years (20.5%); the county total dependency ratio is at 71.3% with child dependency (59.7%) and old age dependency (11.6%) (KNBS, 2019) Makueni County has a poverty index of 34.5% which is slightly lower than the national index of 35.7% This means approximately a third of the total population is highly vulnerable to climate risks.

The County is characterized by three main agro-ecological zones namely; the Upper Middle, Lower High and the Lower Middle zones. The Upper Middle (UM) zone mainly covers the uplands of Mbooni and Kaiti that practice coffee, avocado, macadamia, maize and beans farming and Dairy farming. The Lower High (LH) zone is mainly found in Makueni and Kilome sub-counties where mango and citrus fruits, grains, and root tubers farming are practiced. The lower Middle (LM) zone covers Kibwezi West and Kibwezi East; where cowpeas, pigeon peas, dolichols, green grams, sorghum are mainly grown and also characterized by rangelands suitable for livestock production. Other economic activities include quarrying and small-scale mining

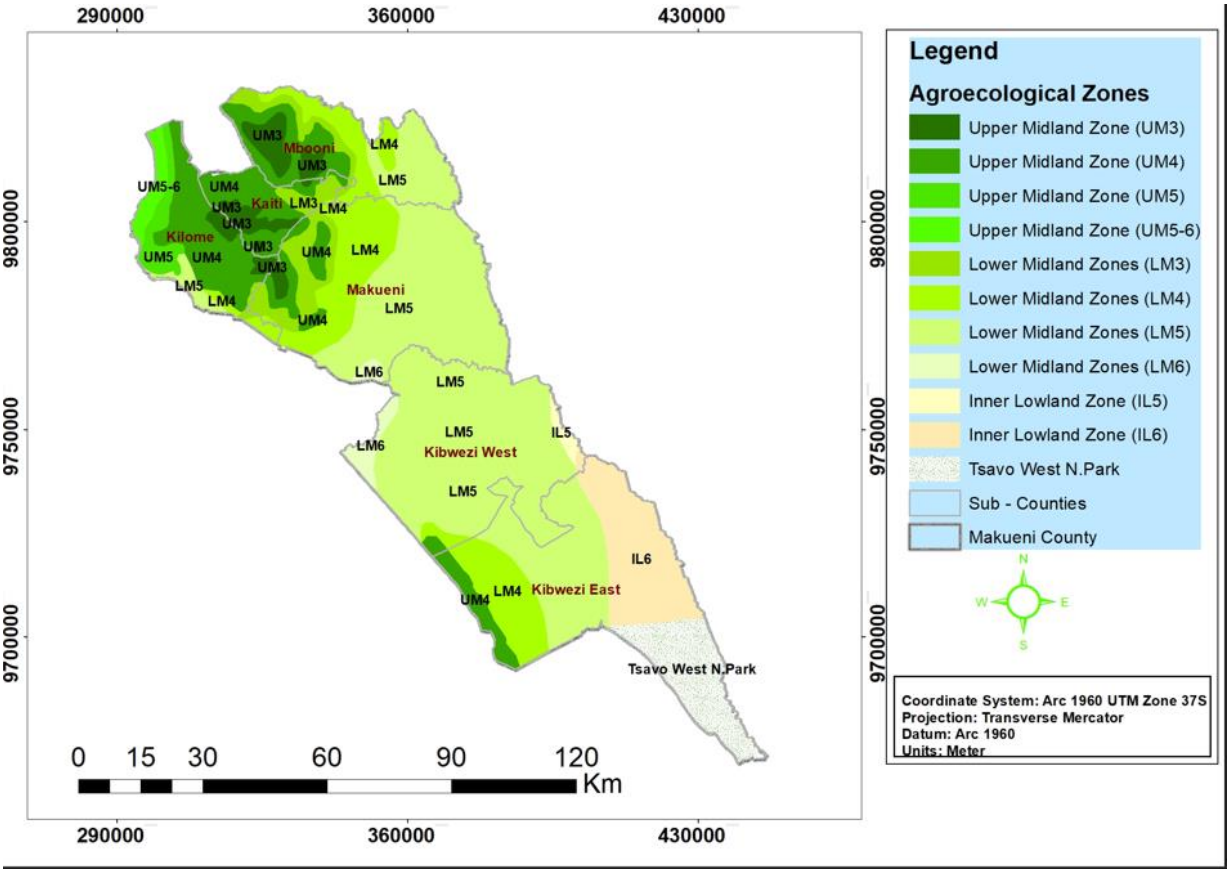

Figure 1: A map Agro-Ecological Zone in Makueni County

Table 1: Agro-Ecological Zone in Makueni County

Zones	**Area in Km2**	**Description**
INNER LOWLAND ZONES	**670**	
IL5	39	Inner Lowland Livestock-Millet Zone
IL6	631	Inner Lowland Ranching Zone
LOWER MIDLAND ZONES	**5352**	
LM3	389	Cotton Zone
LM4	1094	Marginal Cotton Zone
LM5	3757	Livestock - Millet Zone
LM6	112	Midland Ranching Zone
UPPER MIDLAND ZONES	**1691**	

UM3	311	Marginal Coffee Zone, Avocado, Macadamia
UM4	1150	Maize - Sunflower Zone-Cotton
UM5	138	Livestock - Sorghum Zone. Cotton
UM5-6	93	Livestock/Sorghum-Upper Midland Ranching Zone

The annual rainfall in upper zones ranges from 1,000MM to 1,250MM and mean temperature ranges from 21^0C to 22^0C. In the middle zone, the annual rainfall ranges from 750MM to 1,000MM and mean annual temperatures range from 22^0C to 24^0C while in the lower zone annual rainfall ranges from 250MM to 750MM and mean annual temperatures range from 24^0C to 25^0C. Given its geographical location and climatic conditions, Makueni County faces unique climate change risks and vulnerabilities. The County is an Arid and Semi-Arid Land (ASAL), characterized by irregular rainfall patterns and frequent droughts. The climate variations Have led to water and food insecurity hence affecting the overall well being of the population.

The water sector aims to improve water access, environmental conservation and sustainable utilization of natural resources. The County has a forest cover of 5.1% and tree cover of 12.47 % with Gazetted forest covering 150.2Km2 and non- gazetted forest 76km2. The major water resources in the county are Thwake, Kaiti, Kikuu and Muuoni Rivers, wetlands such as Mangelete, Kiu, Kiboko, springs such as; Mzima, Umanyi, Kibwezi. The County has 1,592 mapped water sources including Earthdams, Sand dams and boreholes with a 39,000m3 water production. The County has gazetted national parks covering an area of 1276.5km2.

The average farm size in Makueni is 0.25Ha where main cash crops are coffee, macadamia, French beans and fruit trees. Food crops include maize, beans, green grams, cowpeas, cassava and sweet potatoes. The County promotes fruit value chains for Mango, Citrus, Macadamia, and Avocado, livestock value chains and pulse value chains. The area under green gram production is 69,955 Ha, while the area under pigeon peas is 65,279 Ha. The area under cowpeas increased is 63,564 Ha while the area under maize is 150,726 Ha. The area under avocado is 270 Ha and area under mangoes is 21,309 Ha. To enhance the value chains the county has a Makueni Integrated Grain Value addition plant with a processing capacity of 2 metric tonnes per hour and

the Makueni fruit processing plant. The county paved road network is 502.7 Km. The electricity connectivity is 25 % and ICT literacy is 57%.

The County has One level five hospital, 14 level four and 347 level 3. The leading cause of morbidity for the under-fives is the upper respiratory tract infection while upper respiratory tract infections and hypertension are the leading causes of morbidity among the over fives.

The number of registered PWDs in the County is 11,795 out of 36,369 PWDs in the County. The County has 1,620 registered community groups. The county has 2 talent centers and the main programs on social protection are food and non-food programmes, enrollment of elderly to NHIF, sponsorship to the needy and OVCs. The County boasts various trade and tourism sites such as national parks; Chyulu Hills and Tsavo West national parks. The area under National Parks and reserves is 1,276.5$KM^{2.}$ The County's urbanization rate is 8% with main urban centers including, Wote, Emali, Kibwezi, Mtito Andei, Makindu, Kikima, Konza and Sultan Hamud. The County has 5,042.7KM^2 as arable land and 1,762.7KM^2 as non-arable land.

1.2 Purpose and Process of the CCCAP

The steps in the participatory climate action planning process included review of available documents on previously done participatory vulnerability capacity assessment and other climate related county research papers by line departments. The action plan culminates from a step-wise data collection process which proposed intervention priority actions that led to the development of the CCCAP. The process had participants from all social groups and all vulnerabilities identified affected women, youth, people living with disabilities and the elderly more hence they were mapped as the vulnerable groups. The proposed interventions/priority actions will therefore benefit the vulnerable groups mostly affected by climate risks. The actions will help to reduce the distance to water sources allowing the communities to engage in other economic activities such as provision for food for the elderly, children and other defendants during the occurrence of climate hazards.

The Makueni County Climate Change Action Plan (CCCAP) is a strategic document that outlines the priorities, goals, and actions to address climate change challenges within the county . It provides a roadmap for integrating climate considerations into development planning, resource allocation, and policy formulation. The primary purpose of the CCCAP is to enhance

climate resilience, promote sustainable development, and safeguard the well-being of communities and ecosystems.

The development of the County Climate Change Action Plan typically involves a participatory and inclusive process to ensure that diverse stakeholders, including women, youth, people living with disabilities, and other vulnerable groups, have an opportunity to contribute their perspectives, knowledge, and experiences. The process seeks to empower these groups and enable them to actively participate in decision-making and planning processes.

Summary of County Climate Change Action Plan process

Step 1: Review of Key documents
Step 2: Collect public inputs using the climate Risk Assessment Report
Step 3: Drafting the CCCAP
Step 4: Public feedback on draft CCCAP
Step 5: Development of Second draft of CCCAP
Step 6: Presentation to Cabinet for approval
Step 7: Presentation to County Assembly for adoption
Step 8: Ceremonial approval / launch by Governor

1.3 Underlying Climate Resilience Context

Climate change is altering the face of disaster risk by complicating disaster risk reduction and increasingly making it difficult not only to predict the timing and magnitude but also to effectively deal with the disaster as they occur due to the compounding effects

Climate change is increasing the frequency and severity and the area affected by disasters and thus undermines sustainable development. The sensitivity of climate risks is determined by household and community characters, quality of housing and physical systems and functionality of access to access services and utilities. This reduces the adaptive capacity in terms of mobilization of response resources, information skills and communication, and institutional and social capital.

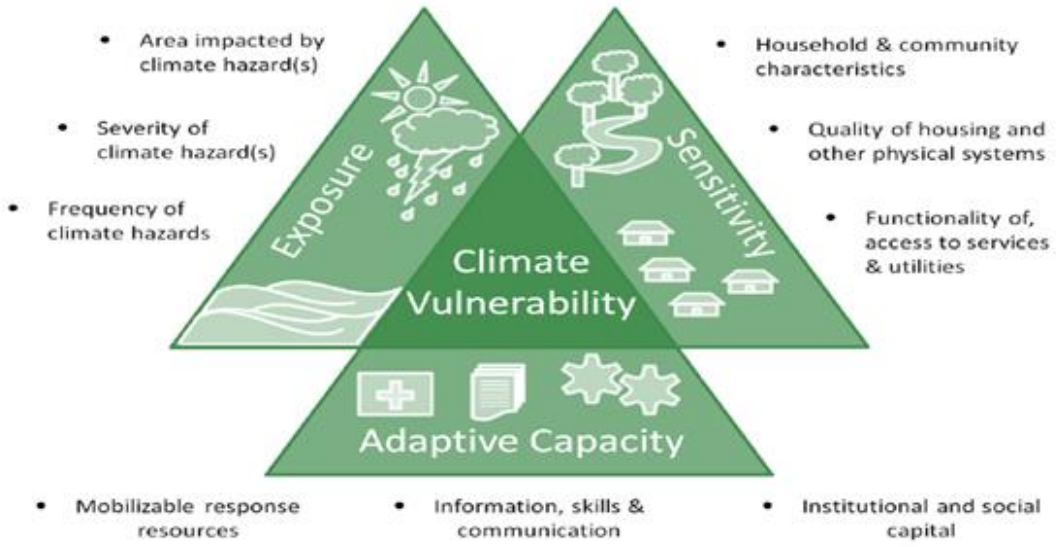

Figure 2: Underlying Climate Vulnerability and Adaptive Capacity

In this case more exposure and sensitivity increase vulnerability and more adaptive capacity decreases vulnerability. The key therefore is in improving the coping ability (adaptation) to increase the resilience of the community

1.4 Impacts of Climate Hazards in the County

Makueni county is affected by mainly three hazards namely drought, flash floods and strong winds, which are associated with climate risks such as forest fires, mudslide, crop pests and diseases, livestock pests and diseases, human wildlife conflicts, human diseases and environmental degradation and social risks. The impact of these is immense, affecting an estimated both rural urban population and undermining the gains being made in economic and human development. This in turn increases the vulnerability of communities and weakens their capacity to manage such shocks.

Makueni County is predominantly inhabited by agro-pastoralists and pastoralists. The livelihoods of the citizens depended on rain fed agriculture and livestock farming. However, the middle zone and lower zone are not suitable for rain fed agriculture due to physical conditions such as aridity and poor vegetation. Climate resilience in these areas is built more on net crop and livestock revenue combined rather than crop and livestock alone

Table 2: Drought - Risks and Impacts

Impact chain	Social impacts	Economic impact	Environmental impact
1.Water scarcity	● Exacerbate resource-based conflict ● Depletion of water for human use (for drinking, cooking and cleaning) and livestock use ● Decline in health (through lack of safe drinking water) ● Long distance to water points ● Increased GBV cases	● Forced sale of household assets ● Heavy expenditure on water purchase ● Depletion in water for use in business/ industry - unemployment	● Loss of aquatic life ● Human wildlife conflicts
2.Decline in agricultural production	● Decline in crop yields and thus increased food insecurity ● Acute food insecurity among vulnerable households ● Increased crime ● Civil unrest/conflict; ● Decline in health (through malnutrition) ● Increased GBV cases	● Heavy strain on both the local and national economies through relief food ● Forced sale of household assets ● Heavy expenditure on food purchase	● Loss of soil fertility ● Human wildlife conflicts
3.Reduced pasture	● Livestock losses ● Conflicts due to pasture for animals	● Heavy expenditure on food purchase ● Low income from livestock sale and products	● Accelerated soil erosion through animal trampling

4.Land degradation	● Reduced land productivity-agriculture ● Civil unrest/conflict; ● Displacement/migration	● Forced sale of land; ● High cost of land rehabilitation and restoration	● Loss of soil fertility ● Loss of vegetation cove ● Forest fires

Table 3: Crop pests and Diseases

Direct impacts	**Indirect impacts**
• Total crop failure • Drying of crops • Food and nutrition insecurity • Low yields - Low quantity of agricultural produce • Disease outbreaks • Soil pest infestation affecting proper crop growth • Low quality agricultural products • Crop wilting • Flower abortion	• Reduced income due to crop failure • Loss of employment • Failure of business depended on agricultural production • Malnutrition • Increase in poverty cases • Low quality of life and living standards • Social risks- school dropout, family break-up, emergency of street children, child pregnancies • Moral decadence • Increase in GBV cases • Low income from agricultural farming • Hunger and famine • High cost of agricultural production

Table 4: Livestock pests and diseases

Direct impacts	• **Socio-economic impacts**

• Emaciation of livestock • Death of livestock • Diseases transmission • Livestock health deterioration • Low quality and quantity of animal products	• Failure of business depended on livestock production • Low quality of life • Low income • High cost of livestock production • Increase in poverty • Social risks- school drop out

Table 5: Environmental Degradation

Direct impacts	**Socio-economic impacts**
● Gully formation ● Drying of plants and loss of vegetation ● Siltation of dams ● Death of wild animals ● Human wildlife conflicts ● Soil erosion ● Reduced pasture ● Destruction of water catchment areas ● Drying of water sources ● Destruction of wildlife habitats ● Deforestation	● Infrastructure breakdown ● Degradation of farm lands ● High cost of land rehabilitation and restoration

Table 6: Human Wildlife Conflict

Direct impacts	**Socio-economic impacts**
● Destruction of crops in farms ● Damage to water infrastructure ● Injury to human ● Death to human	● Huge losses in agriculture ● Destruction of assets

Table 7: Human Diseases

Direct impacts	Socio-economic impacts
• Stigma and depression • Loss of life • Disease transmission	• High expenditure on hospital bills • Low quality of life • Discrimination and isolation

1.5 Exposure and vulnerability of Makueni County to Climate Change Hazards

Makueni County through the PCRA process mapped and ranked risks and hazards. The hazards were ranked from drought, livestock and crop pests and diseases, environmental degradation, human diseases, pollution, and human-wildlife conflict. The identified vulnerable groups were elderly, women, children, PWDs, single parents, orphans, widows and widowers, PLHIV, the terminally sick, youth, teenagers (13-18), senior bachelors, sex workers and child-headed families. **The figure 3** below shows the presentation of climate risks in the entire County. Drought, food insecurity and environmental degradation are the main climate risks identified during the Ward consultations meeting. The risks were further analyzed per sub county to give more insights on how the Sub County are exposed to the risks.

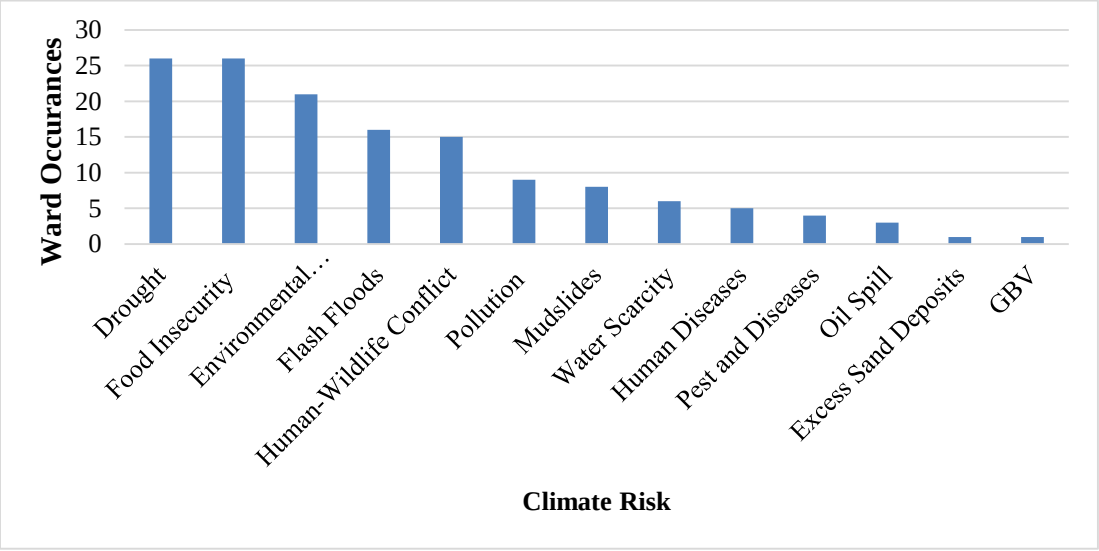

Figure 3: Makueni County Climate Risks and hazards

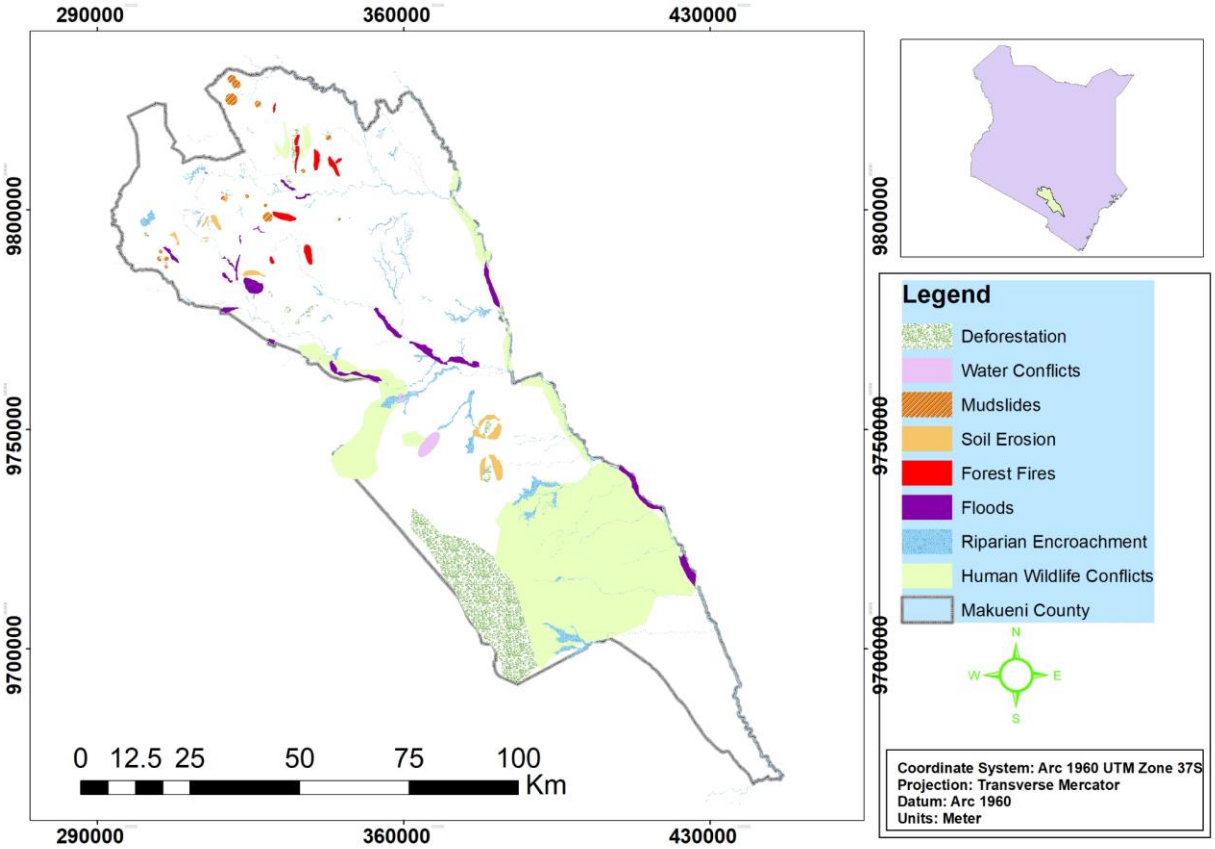

Figure 4: County Climate Hazard and Risk Map

1.5.1 Kaiti Sub County Climate Risks and Hazards

Kaiti sub-county is located to the north of Makueni County. It has a population of 116,010 as per 2019 census. The main land use practices are subsistence crop farming; fruit farming (mangoes and oranges, avocado, passion fruit and loquats); woodlot farming in Kilungu and Ilima wards; horticulture and mining of kaolin in parts of Kilungu, Kee and Ilima wards. Majority of the population (91%) use firewood as a source of energy which is the highest amongst the sub counties. **Figure 5** below shows climate risks and hazards with environmental degradation identified as the highest climate risks affecting the four wards.

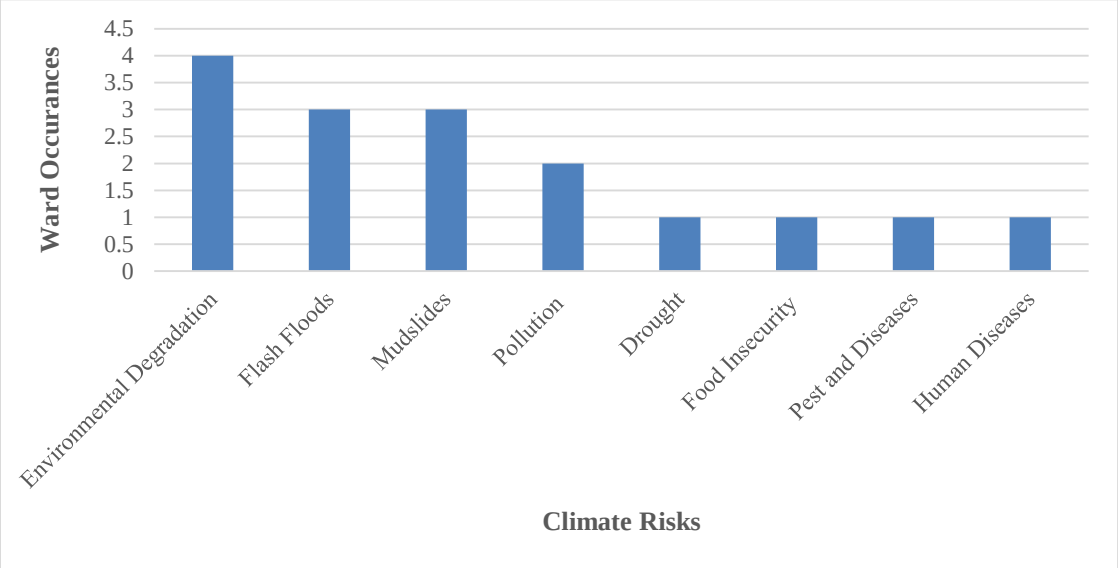

Figure 5: Kaiti Sub County Climate Risks and Hazards

Some of the risks and hazards identified by the communities were also represented using the maps as shown in **figure 6** below.

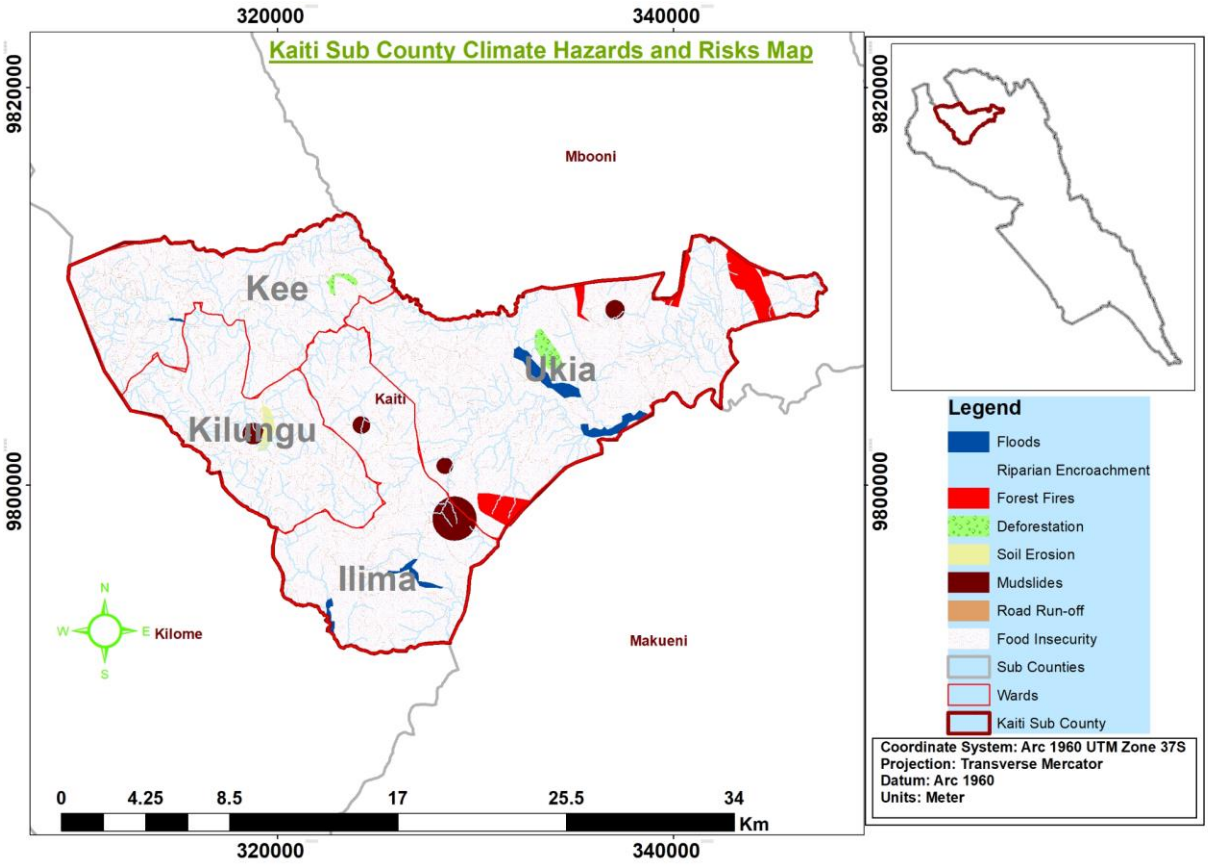

Figure 6: Kaiti Sub County Climate Hazard and Risk Map

1.5.2 Kilome Sub County Climate Risks and Hazards

Kilome sub-county borders Machakos County to the North, Kibwezi-West sub-county to the South, Kajiado County to the West and Makueni sub-county to the East. The population is 102,897 and the sub-county consists of three wards namely: Kiimakiu/Kalanzoni, Mukaa, and Kasikeu. It is categorized as a semi-arid area receiving an approximate range of 500-750 mm of precipitation annually and temperatures of between 21-25°C annually. Climatic fluctuations within the sub-county such as dry spells, intense precipitation leading to floods, and heat stress, are all hazards that contribute to not only agricultural risk but also decreased vegetative cover in the sub-county. The risks are as shown in **figure 7** below.

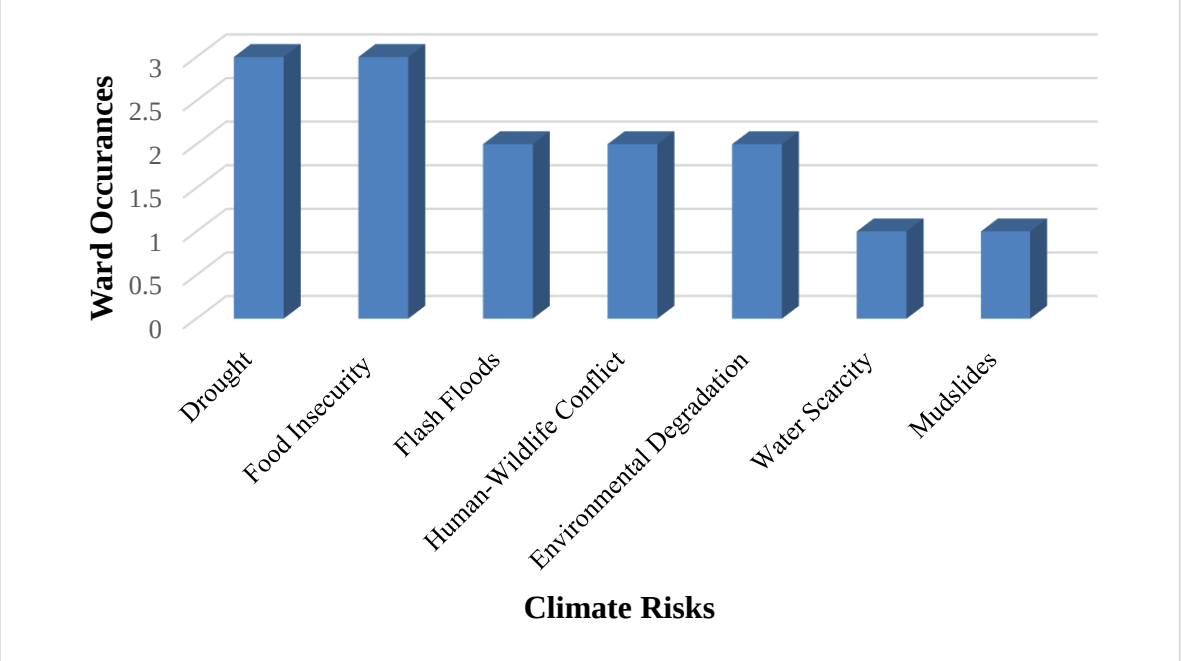

Figure 7: Kilome Sub County Climate Risks and Hazards

Some of the risks and hazards identified by the communities were also represented using the maps as shown in **figure 8** below.

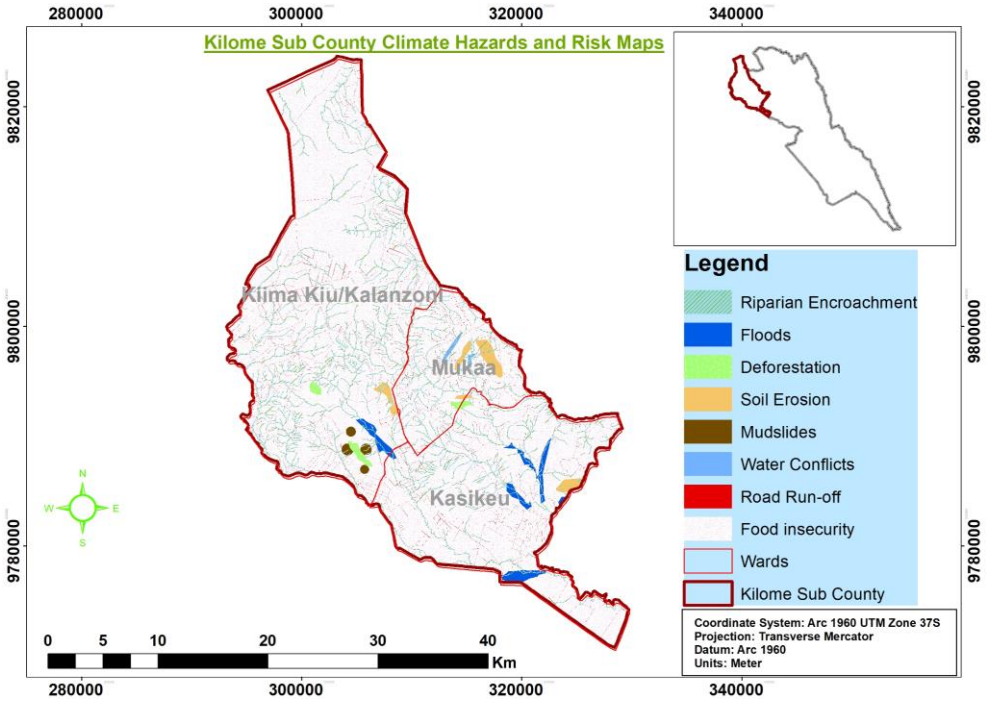

Figure 8: Kilome Sub County Climate Risk Map

1.5.3 Mbooni Sub County Climate Risks and Hazards

Mbooni sub county has a population of 181,046. It has the following wards; Mbooni, Tulimani, Kalawa, Kako/Waia, Kisau/Kiteta and Kithungo/Kitundu. The climatic condition of the sub county is semi-arid, rainfall averages 800-1200mm and temperature ranging 16-24°C. The major climate risks and hazards are shown **Figure 9** below.

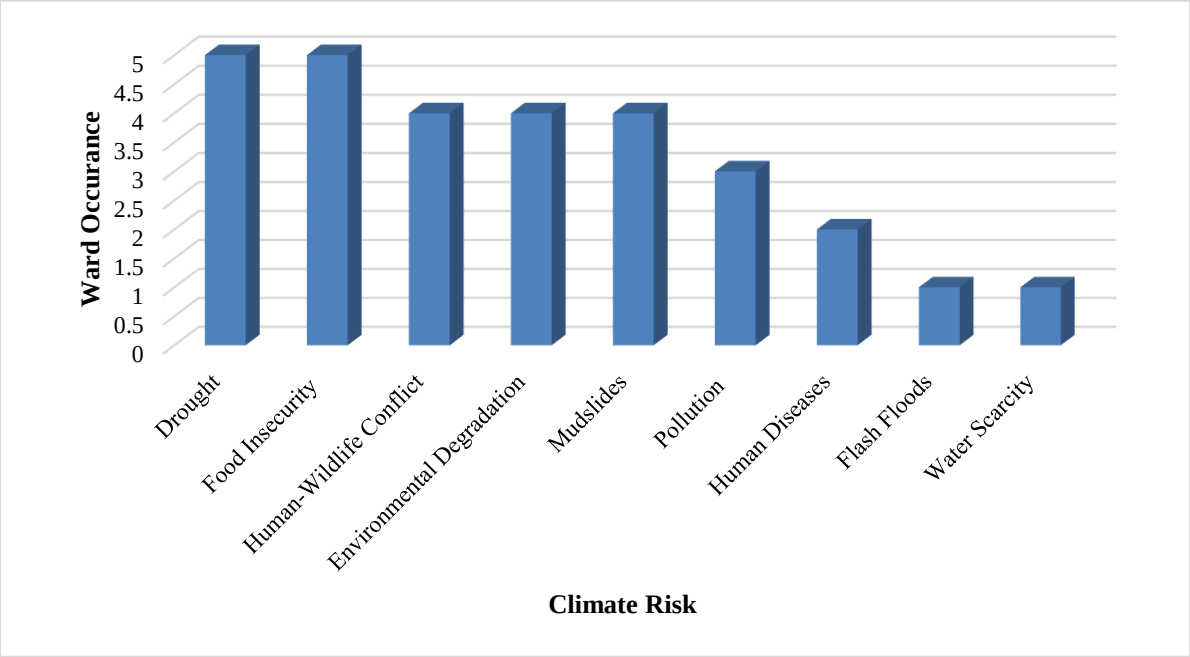

Figure 9: Mbooni Sub County Climate Risks and Hazards

Some of the risks and hazards identified by the communities were also represented using the maps as shown in **figure 10** below.

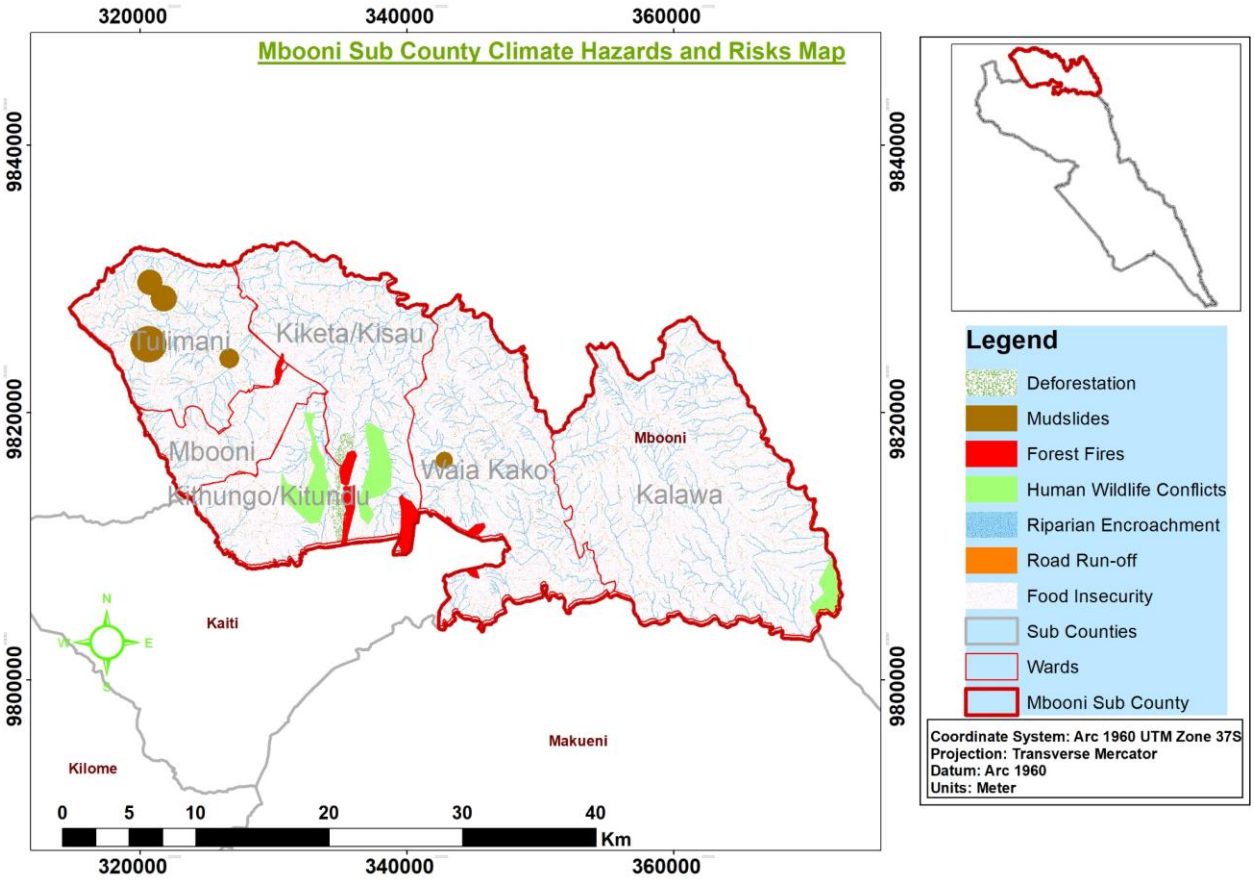

Figure 10: Mbooni Sub County Climate Hazards and Risks Map

1.5.4 Makueni Sub County Climate Risks and Hazards

Makueni Sub-county is one of the six sub-Counties in Makueni County. It has a population of 203,560. It comprises the following County Assembly Wards: Wote/Nziu, Muvau/Kikumini, Mavindini, Kitise/Kithuki, Kathonzweni, Nzaui/Kilili/Kalamba and Mbitini. Temperatures range from a minimum of between 12°C to a maximum of 28°C. Rainfall ranges from 150mm to 650 mm per annum typical of ASALs in Kenya. The major economic activities include livestock rearing, crop farming, agroforestry, sand harvesting, charcoal burning, and brickmaking. The major livestock include cattle, pig, sheep, goat, poultry and donkey. The major crops produced include green gram, sorghum, maize, mango, cowpea, bean, pigeon pea and citrus. **Figure 11** below shows the climate risks and hazards experienced in the Sub County.

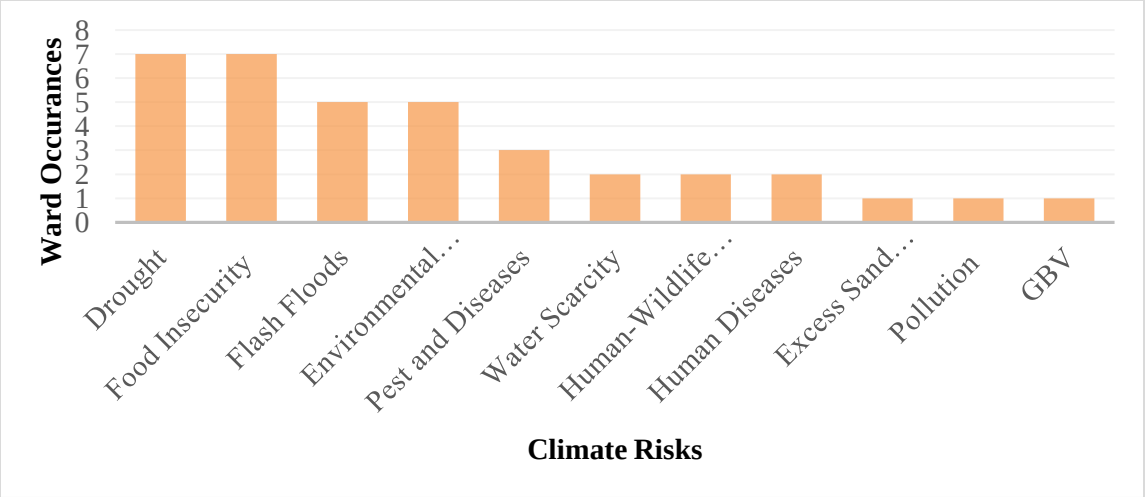

Figure 11: Makueni Sub County Climate Risks and Hazards

Some of the risks and hazards identified by the communities were also represented using the maps as shown in **figure 12** below.

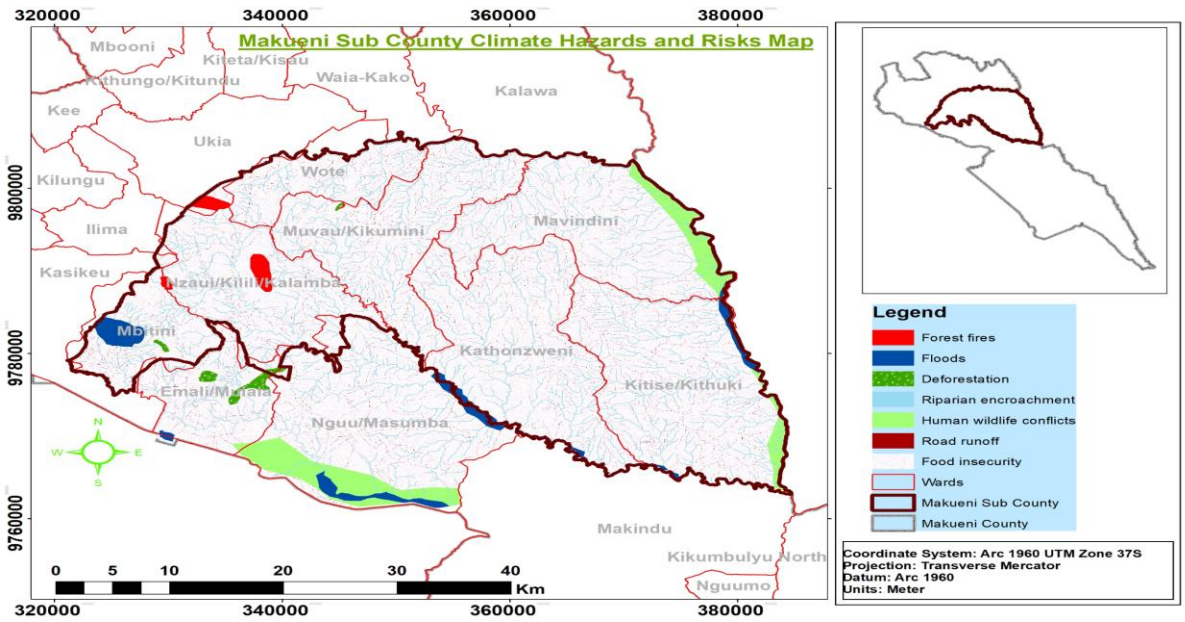

Figure 12: Makueni Sub County Climate Risk Map

1.5.5 Kibwezi West Sub County Climate Risks and Hazards

Kibwezi West has an approximate population of 203,102. It has six electorate wards which include Makindu, Nguumo, Kikumbulyu South, Kikumbulyu North, Emali/Mulala and Nguu/Masumba. The sub-county is largely arid and semi-arid and usually prone to frequent droughts, with rainfall ranging from 300-400mm annually. The depressed rains in the Sub County hardly sustain the major staple food of maize and beans. Unfortunately, the traditional crops which are drought tolerant have largely been abandoned. This means livestock rearing remains the most common viable economic activity being undertaken by the local people in the region. The condition has negatively affected agriculture which is the main economic activity in the Sub County. Rain fed agriculture has been affected largely by impacts of climate change. The graph below shows the climate risks experienced in the Sub County.

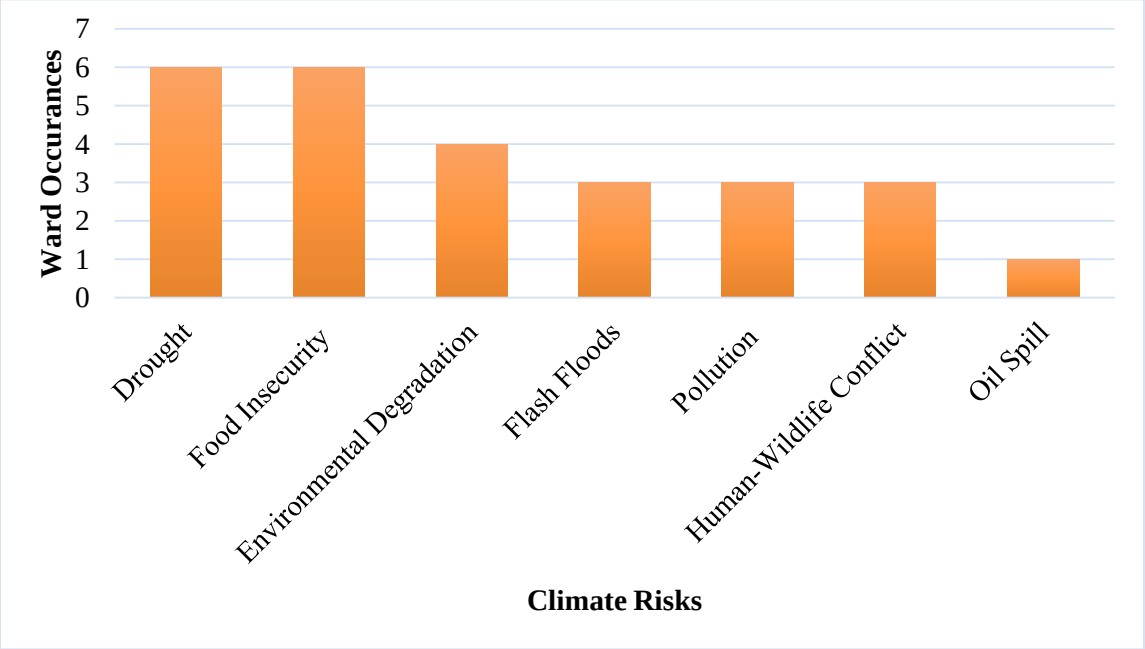

Figure 13: Kibwezi West Sub County Climate Risks and Hazards

Some of the risks and hazards identified by the communities were also represented using the maps as shown in **figure 14** below.

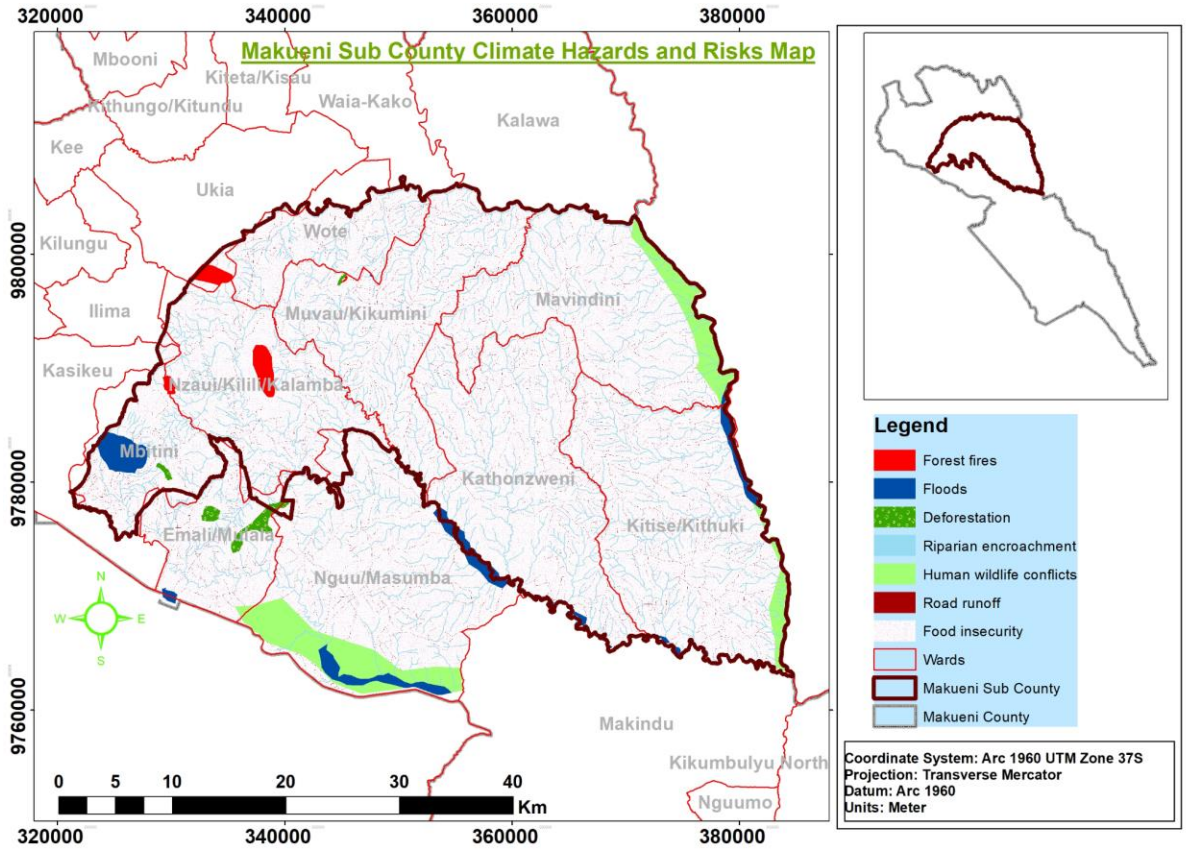

Figure 14: Kibwezi West Sub County Climate Risk Map

1.5.6 Kibwezi East Sub County Climate Risks and Hazards

Kibwezi East has a Population of 142,933. It comprises the following wards Masongaleni, Mtito Andei, Thange, and Ivingoni/Nzambani. Drought, heat stress, increased precipitation, moisture stress, and increased temperatures are the most problematic climatic hazards in the subcounty. The sub-county receives an average of about 650-750mm of rainfall annually and the temperatures range between 20.2 and 35.8°C. The **figure 15** below shows the climate risks in the Sub County.

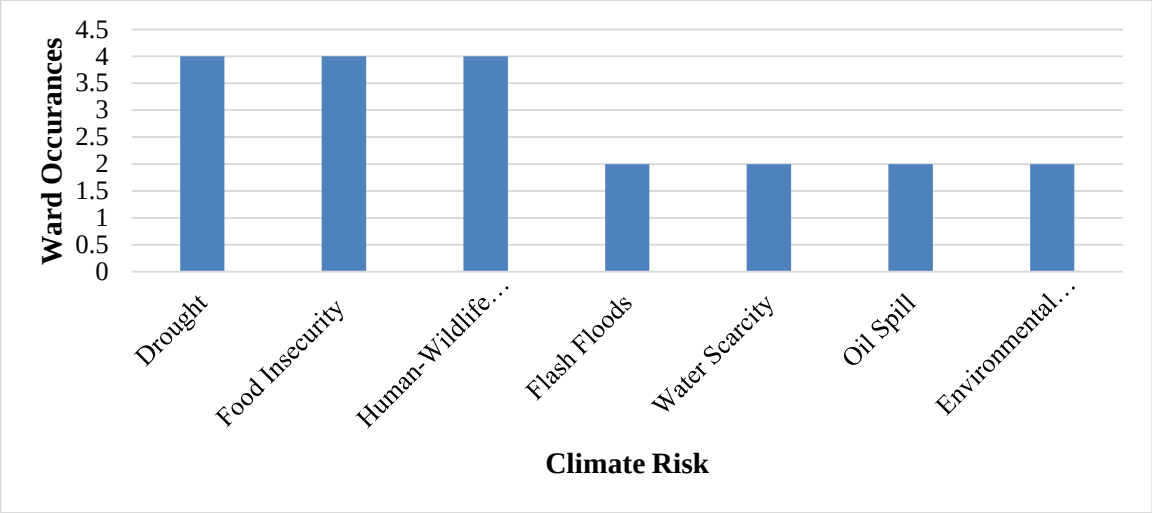

Figure 15: Kibwezi East Sub County Climate Risks and Hazards

Some of the risks and hazards identified by the communities were also represented using the maps as shown in **figure 16** below.

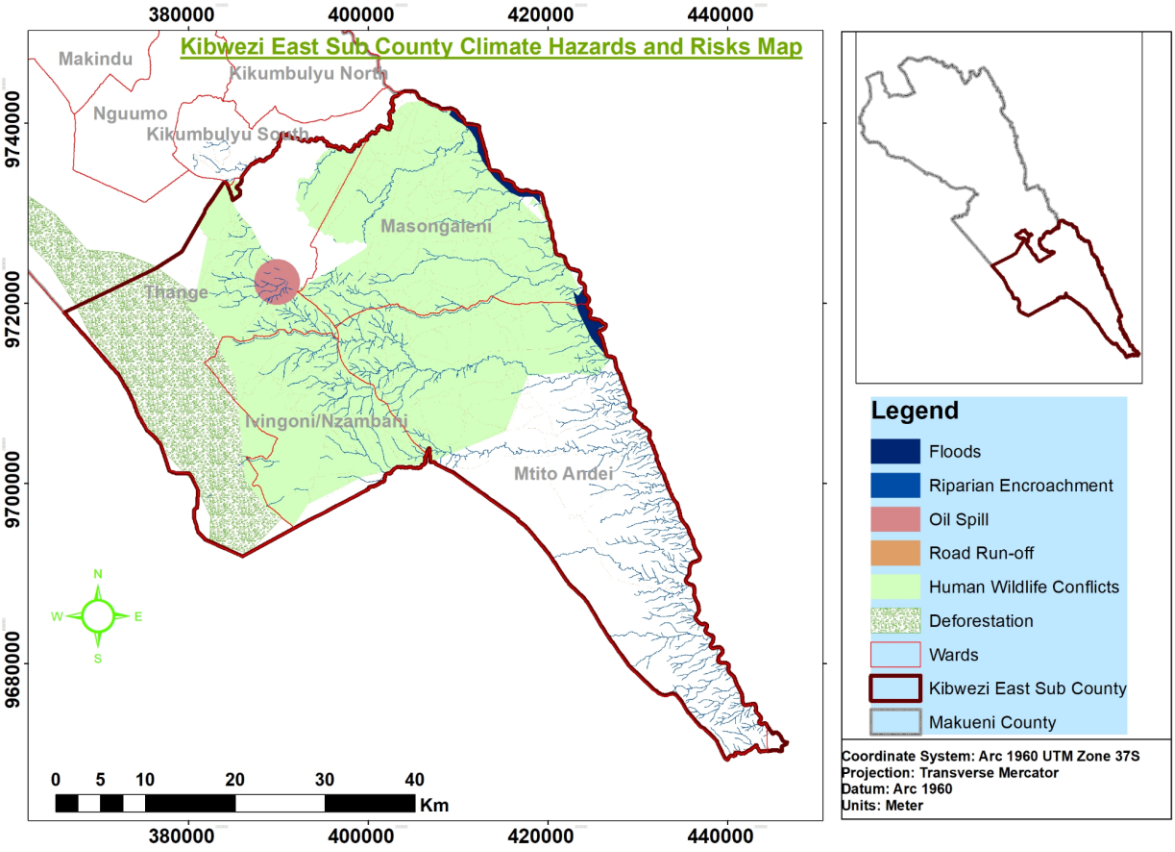

Figure 16: Kibwezi East Sub County Risk Map

1.6 Summary of Differentiated Climate exposure and Vulnerability of key groups and livelihoods in the County

Table 8: Differentiated Climate exposure and Vulnerability of key groups and livelihoods

Summary of Differentiated Climate exposure and Vulnerability of key groups and livelihoods in the County					
Children and OVCs	**Women**	**Youth**	**Elderly**	**PWLD and special needs**	**Terminally ill**
• Resource poor • Depended on HH heads • Not involved in decision making • Low immunity • Not involved in • Low adaptive capacity • Very sensitive to climate stressors	• Resources poor • Depended on HH heads • Depends on casual Labour • Cultural Limitations and values • Left and no equal opportunity in decision making • Low adaptive capacity.	• Resource poor • Depended on HH heads • Depends on casual labour • Left and not equal opportunity in decision making • High unemployment	• Depended on HH heads • Depends on casual labour • Low immunity • Not energetic • Old-age diseases reduce their adaptive capacity	• Resources poor • Depended on HH heads • Depends on casual labour • Left and not equal opportunity in decision making • Stigmatization • Depressed • Discriminated and isolated • Cultural myths that	• Resources poor • Highly depended on relatives • Depends on casual labour • Left and not given equal opportunity in decision making • Low immunity • Stigmatization • Depressed • Discriminated and isolated • Cultural myths terming them as cursed

				they are cursed	

1.7 Brief Overview of Climate Change Actions in the County

1.7.1 Mainstreaming of NCCAP in County Actions

This National Climate Change Action Plan (NCCAP) 2018-2022 is a five-year plan to steer Kenya's climate change action. The Plan derives from the Climate Change Act (Number 11 of 2016), which requires the Government of Kenya (GoK) to develop Action Plans to guide the mainstreaming of climate change into sector functions. NCCAP 2018-2022 will further the achievement of Kenya's development goals by providing mechanisms to realize low carbon climate resilient development. It emphasizes sustainability, while prioritizing adaptation and enhanced climate resilience for vulnerable groups, including women, youth, persons with disabilities, and marginalized and minority communities.

The Makueni County Climate Change Action Plan is in line with the National Climate Change Action Plan by: Aligning Climate Change actions with the government's development agenda including the Big Four, incorporating the principles of consultation and cooperation, Gender equity and social inclusion (GESI) mainstreaming Climate Change in the Makueni County Integrated Development Plans (CIDPs) committing 2 % of its annual development budget for climate change and embracing participatory development where by the process of identifying the County Climate Change Action plans was participatory through engaging development partners, private sector, civil society, and vulnerable groups including PLWDs, youth and women within society and the marginalized communities.

1.7.2 Climate Change in CIDP 2023-27

The County in its CIDP 2023- 2027 has identified Climate change as one of the major risks impacting on the Counties development and has set Climate change mainstreaming as an agenda for inter- linkage. Water, Environment and Natural Resources Sector which is the line sector on climate change matters, one of its four goals is to enhance natural resource

management and sustainability for climate change resilience. The other County Sectors have mainstreamed and identified programs for implementation of climate actions. The priority actions in the CIDP link with County Climate actions in the plan identified during the participatory Process.

Table 9: Mainstreamed Climate actions in CIDP 2023-2027

Sector	Program
Transport, Infrastructure, Public Works and Energy	● Enhanced green energy development and adoption ● Rural Electrification
Agriculture Rural Development	● Irrigation Development program ● Agriculture value chain development program- pulses and grains, livestock, Bee Keeping, Fisheries, Dairy and poultry development,
Health Sector	● Preventive & Promotive health services
Education, Social Protection and Recreation	● Enhanced sporting and recreation development ● An equitable society free from discrimination from all forms of gender-based violence
General Economics	● Trade Development and Promotion
Land and Urban Development	● Land survey, mapping and Titling
Devolution	● Resource Mobilization ● Climate sensitization programs
Environment Water and Natural Resource	● Integrated Water Harvesting, Storage, Treatment & Distribution ● Forest and landscape restoration ● Water Catchment Protection

1.7.3 Partnerships and Collaborations for Climate Actions in the County

Makueni County Forest and Landscape Restoration Opportunities Assessment

The County partnered with World Resources Institute (WRI) to carry out an analysis of the county tree-based landscape restoration opportunities and challenges. The Assessment identified potential restoration opportunities in: Afforestation or Reforestation of Natural Forests, Rehabilitation of Degraded Natural Forest, Agroforestry on cropland, commercial tree and Bamboo Plantations on Potentially Marginal Cropland and Un-Stocked Plantation Forests, Tree-based Buffer Zones along Water Bodies and Wetlands and Tree-based Buffer Zones along Roads.

The landscape challenges identified included; Poor land use planning and tenure; Soil erosion and infertility; Encroachment; Overgrazing and overstocking; and poor agricultural practices. These challenges are directly linked to the climate risks identified during the PCRA process. Implementation of these opportunities will address the risks prioritized in the County Climate Change Action plan.

Towards Ending Drought Emergencies Project (TWENDE)

This is an Ecosystem Based Adaptation (EBA) in Kenya's Arid and Semi-Arid Rangelands. The objective of the TWENDE project is to reduce the cost of climate change induced drought on the national economy by increasing resilience of the livestock and other land use sectors in restored and effectively governed rangeland ecosystems. The project wards in Makueni are: Nguumo, Makindu, Thange, Ivingoni/Nzambani, Nguu/Masumba.

These areas were mapped to be high potential pasture establishment and management areas during the PCRA process. The project therefore enhances productivity of rangelands thus

National Agricultural Value Chain Development Project (NAVCDP)

The project aims at supporting small scale farmers who will be transitioning or have potential to transition from subsistence farmers to commercial farmers. This contributes towards addressing climate risks in agriculture and livestock production which were distinctly identified during the PCRA process.

Kenya Informal Settlement Project (KISP)

The project endeavors to increase land tenure security and slum upgrading in major Informal settlements in Makueni in: Misongeni- Makindu Town, Soko Mjinga- Emali Town and Mjini in Kibwezi Town. The project speaks to the Makueni CIDP 2023-2027 on Land survey, mapping and Titling and the CCCAP on enhancing the resilience of urban areas through integrated solid waste management and creation of green spaces.

Delivering nature-based solution outcomes through strengthened policy implementation institutional capacity, and enhanced monitoring and reporting of forest and landscape restoration in Kenya

The County collaborated with ICRAF and FAO in delivering nature-based solution outcomes. The project aimed at Capacity strengthening and scaling gender-responsive, context-appropriate water management options, tree growing and sustainable wood-fuel systems in Makueni; Co-development, implementation, and capacity building on NbS and FLR monitoring and reporting frameworks; Strengthening coordination of community forest associations (CFAs) and their contribution to county forest conservation and management policies; Gender, Equity and Social Inclusion (GESI): Building institutional capacity for equitable and inclusive FLR. The project found out that there has been GESI inequality in landscape restoration. The project further built capacity to various groups on nature-based solutions and GESI inclusion in landscape restoration which has not yet covered the whole county. Trainer of Trainer community members have been trained to help achieve GESI in landscape restoration in the whole county.

CHAPTER TWO: CLIMATE CHANGE POLICY ENVIRONMENT

2.1 National Policy Framework

2.1.1 The Constitution of Kenya

Article 42 of the constitution, provides for the right to a clean and healthy environment for every Kenyan which includes the right to have the environment protected for the benefit of the present and future generations, thereby establishing commitment to ecologically sustainable development. Makueni County has an Environment and Climate Change Department, mandated with the implementation of the devolved environmental functions.

2.1.2 Environmental Management and Coordination Act (EMCA) 1999 Rev 2015

The Act provides for environmental management and conservation, including climate change mitigation and adaptation. The Act makes provision for environmental protection through; Environmental impact assessment, Environmental audit and monitoring and Environmental restoration orders, conservation orders, and easements. Makueni county undertakes Environmental and Social Impact Assessments for development projects to ensure sustainability and has a gazetted County Environment Committee (CEC) that coordinates environmental matters

2.1.3 Climate Change Act, 2016

Its main objective is to enhance climate change resilience and low carbon development for sustainable development in Kenya. The Act establishes Climate Change institutional structures and climate change funds. The Makueni County Climate Change Act 2022 is aligned to the Climate Change Act 2016 and this provides for the County Climate Change Fund and a framework for strategic interventions to address climate change impacts in the County.

2.1.4 National Climate Change Response Strategy

The strategy focuses on strengthening national actions towards Climate Change assessments and adaptations and GHG emissions mitigation by ensuring commitment and engagement of all stakeholders in view of the vulnerable nature of Kenya's natural

resources and society. The National Climate Change Response Strategy provides for vulnerability assessment which Makueni County undertook. The strategies provide for interventions in key sectors which will inform the strategic actions in the County Climate Change Action Plan.

2.1.5 National Climate Change Action Plan (NCCAP) 2018-2022

The objective of the plan is to encourage low carbon climate resilient development throughout the Country in a manner that prioritizes adaptation. It also considers the impact of climate change on Kenya's socio-economic sectors and further identifies strategic areas where climate action can be linked to the big four agenda. The County has formulated the County Climate Change Action Plan inline with NCCAP.

2.1.6 National Climate Change Framework Policy, 2018

The document provides a framework to guide the development and implementation of detailed climate change interventions listed in the climate change action plans. The policy aims to integrate climate change considerations into planning, budgeting, implementation and decision making at the National and County level and across all sectors. It also established a funding mechanism and strategy that enables implementation of priority actions for climate resilience, adaptive capacity and low-carbon growth. The County has mainstreamed climate change into the CIDP

2.1.7 National Adaptation Plan (2015-2030)

The National Adaptation Plan details institutional arrangements, including monitoring and evaluation processes. It also provides an analysis of the current and future climate trends in Kenya, highlighting key institutional and policy coordination relevant to climate change and presents a climate risk profile for the Country. It further identifies priority actions in key planning sectors for the short, medium and long in line with the Country's development plan. The County has developed a County Adaptation Plan in line with the National Adaptation Plan (2015-2030)

2.1.8 Climate Smart Agriculture Strategy (2017-2026)

The broad objective of the strategy is to adapt to climate change resilience of agriculture systems while minimizing emissions for enhanced food and nutritional security and

improved livelihoods. In this respect the strategy aims at enhancing the adaptive capacity and resilience of the actors in the agriculture sector by addressing cross-cutting issues that adversely impact climate -smart agriculture. The strategy recognizes the role of the Climate Change Act and NAP in improving coordination and collaboration among institutions and stakeholders in climate smart agriculture.

2.1.9 Energy Act, 2019

The Act promotes mitigation of climate change through energy efficiency and renewable energy, and provides for establishment of the Rural Electrification & Renewable Energy Corporation which under its mandate shall harness opportunities offered under clean development mechanism and other mechanisms including, but not limited to, carbon credit trading to promote the development and exploitation of renewable energy sources. The County Energy policy is aligned to the Energy and the County has set strategies to implement

2.2 Makueni County Policy Framework

In recent years, Makueni County has embarked on initiatives aimed at promoting sustainable development and resilience-building. The county government has demonstrated a strong commitment to addressing climate change challenges and integrating climate considerations into its policies and programs.

2.2.1 Makueni County Integrated Development Plan (CIDP) 2023-2027

The Makueni County CIDP 2023-2023 is centered on building a resilient economy for sustainable development. The plan incorporated both international and the Countries commitments on matters related to climate change among them the Paris Agreement on Climate Change, 2015, Sustainable Development Goals one of them being on Climate Action-SDG No. 13 which tasks Countries to take urgent actions to combat climate change and its impacts. The CIDP has outlined different sector programmes. In the Water, Environment & Natural Resources sector, a programme on climate change mainstreaming has been well outlined with an aim of mainstreaming climate change initiatives in the County.

2.2.2 Makueni County Spatial Plan 2019-2029

The plan was developed as a concerted effort to evaluate the County's physical, infrastructural and human resources and also to guide the development activities in the County. In the policy's objectives, one is to maintain a viable system of green and open spaces for a functioning ecosystem and to work towards the achieving and maintenance of a tree cover of at least 10% of the land area of Kenya.

The plan adopts the existing geophysical properties of the County territory as an entry point for formulating the County spatial development framework. Consequently, the three natural components (landforms, drainage and ecology) are integrated into one apparatus that will serve as a primary organizing element in a strategy of "structuring by nature". The strategy entails delineating all the areas within the County that are prone to degradation (steep hill slopes, riparian), hazard prone areas (scarps, volcanic fields), environmentally sensitive areas (wetlands, wildlife habitats). Specific intervention measures are then suggested in relation to each of the areas.

2.2.3 Makueni County Environment and Climate Change Policy, 2020

The Policy recognizes that climate change poses significant environmental implications for Makueni County as some of the adverse impacts are already being observed as evidenced by reduced supply of water from many water sources in the County. Other challenges brought by climate change include floods, mudslides and prolonged droughts. The policy addresses climate change issues in one of its objectives (3.2.7) which is to enhance climate resilience with a policy direction that the Government shall establish mechanisms for enhancing climate change resilience in the County. These will be achieved through implementation of the following strategies; mainstreaming climate change in County sectors, establishing a County climate fund mechanism, capacity building institutions to take up climate change actions and creation of partnership linkages.

2.2.4 Makueni County Climate Change Act 2022

The Act enhances climate resilience through mobilization of resources for development, management, implementation, regulation and monitoring of adaptation and mitigation measures and actions. The Act establishes the CCF Board which shall mainstream climate

change projects, programmes and activities in County planning and budgeting, and ensure their approval and inclusion in the CIDP. The Fund shall also be responsible for coordinating capacity building at Ward and County level and be responsible for financing cross ward and cross County climate change programmes and mobilize funds. The Act affirms allocation of 2% of the County's Development budget to be channeled into the climate change fund

2.2.5 Makueni County Climate Change Fund Regulations 2015

The regulation establishes a County Climate Change Fund with a purpose of providing funding for climate change activities identified in the Makueni County Integrated Development Plan and for connected purposes. The regulations also stipulate on sources of fund and establishes a County Climate Change Fund Management Board which shall manage the funds. Among the functions of the board; is mainstreaming climate change projects, programmes and activities in County planning and budgeting and ensure their approval and inclusion in the County Integrated Development Plan.

Makueni County Disaster Management and Special Programs Policy, 2022

The policy seeks to prioritize disaster management and pursues to promote citizen empowerment within Makueni County by employing a bottom-up approach that focuses on the village level for Disaster preparedness, response, recovery and rehabilitation programmes. Building capacities of people living in disaster prone areas and improvement of their capabilities in order to cope with all hazards is therefore central and critical to the policy intentions of Makueni County.

2.2.6 Makueni County Public Participation Policy, 2020

The policy recognizes that realization of responsive and people driven development requires effective public participation in all stages of the project cycle. Active involvement of the citizens often legitimizes identification with development programmes and projects and ownership of the implemented interventions. The policy prioritizes operationalization of participatory development units through continuous community-based planning, project identification, proposal development and prioritization activities and initiatives. The policy also prescribes for adequate notification of public participation, and provision of timely and accurate information in accessible formats

CHAPTER THREE: MAKUENI COUNTY PRIORITY CLIMATE ACTIONS

3.1 Identified Climate Action priorities during PCRA

This chapter gives itemized county priority climate actions identified during the PCRA. The data is presented in table 10 as shown below.

Table 10: Identified Climate Action priorities during PCRA

Strategic climate action objective	**Proposed possible interventions**
a. Increase water access for irrigation and domestic use all year round.	1. Promotion of water harvesting at household level; 2. Construction/Development of mega water harvesting facilities; 3. Water treatment at house hold level .
b. Increase crop production, productivity and profitability.	1. Development of irrigated agriculture; 2. Development and adoption of climate smart agricultural technologies; 3. Enhance adoption of modern agricultural technologies; 4. Integrated soil and fertility management (ISFM); 5. Reduction of losses from agricultural production (crop pests' control and crop insurance); 6. Research on drought tolerant crops, emerging pests and diseases, and crop varieties that are salt-tolerant; 7. Promotion of various crop value chains; 8. Development of aggregation centers and enhance market linkages; 9. Processing, value addition and quality assurance.

c. Increase livestock production, productivity and profitability	1. Rangeland management; 2. Breed improvement and; 3. Livestock pest and disease control; 4. Fodder and pasture development; 5. Development of livestock marketing yards; 6. Digital linkages; 7. Fisheries development; 8. Development of bee keeping and 9. Processing, value addition and quality assurance.
d. Restore degraded forest and landscapes	1. Farm and rangeland restoration through terracing, agroforestry, grass reseeding, and adoption of alternative sources of livelihoods; 2. Forest restoration; 3. Restoration of riparian reserves; 4. Road reserves restoration and; 5. Promotion of tree nurseries establishment and management; 6. Reduce human-wildlife conflicts and promote human-wildlife coexistence through running programs that support wildlife conservation and ecotourism. 7. Adoption of clean energy for households and commercial uses to help reduce emissions and cost of running projects that require energy.

3.2 Priority County Climate Change Actions

This section discusses the different County climate actions in order of priority and how investment priorities will impact different vulnerable groups while building their adaptive capacity to climate risks that have been projected to increase in the future.

3.3 Promotion of water harvesting for irrigation and domestic use

Water harvesting, distribution and treatment were identified as the top most intervention measures by almost all wards. This is due to the fact that Makueni County is water scarce in the dry months of the year making water access, safety and availability a challenge. The vulnerable groups such as the elderly, women and children who are mostly at home experience this risk thus interventions geared to alleviate the identified water related challenges will reduce their suffering and make them more resilient to vagaries of weather.

Identified climate change actions under water harvesting by communities in order of priority include:

i. Construction of water harvesting structures such as earth dams, earth pans and sand dams;
ii. Promotion of water harvesting at household level using roof catchments and also on farm for micro-irrigation;
iii. Distribution of existing and new water sources to reduce the distance to water points
iv. Treatment of water to make it safe for consumption by humans and livestock.

3.4 Promotion of irrigated agriculture, modern farming technologies and soil fertility management

Once water harvesting has been achieved the communities identified insufficient food production as a major risk emanating from climate risks such as prolonged drought, poorly distributed rains, depressed rains and decreased soil fertility. The vulnerable groups of the elderly, women, PLW HIV/AIDS, PLWD and children suffer whenever famine strikes. The following climate change actions were identified as a remedy for food insecurity:

i. Promotion of irrigated agriculture using the enhanced water harvested in the first priority intervention;
ii. Promotion and adoption of modern farming technologies that maximize on the available rains as per weather predictions such as conservation agriculture, growing drought tolerant crop varieties;
iii. Use of fertilizers after soil testing;
iv. Use of certified seeds;
v. Integrated pest management and;
vi. Promotion of agricultural extension services;

vii. Crop insurance

3.5 Improvement of livestock production and productivity

The residents of Makueni County are agro-pastoralists (farming and keeping livestock) and use this diversification as a way of building resilience to climate change. Some of the livestock types reared are cattle, goats, sheep and chicken. Considering that a big land area of the county is semi-arid, livestock rearing should be done using the most suited breeds to maximize on production. Livestock such as cows, goats and chicken are a source of proteins and climate risks leading to their death affects vulnerable groups such as the elderly, children and the sick exposing them to more diseases such as malnutrition and low immunity. Notable priority actions to improve livestock production and productivity include:

i. Promotion of pasture farming;
ii. Use of improved adaptable breeds that resist pests/diseases and dry conditions;
iii. Capacity building on pest/disease control;
iv. Enhancement of veterinary services;
v. Insurance of livestock.
vi. Extension services

3.6 Restoration of degraded farmlands and forest landscapes

Degraded lands within the farms and forest landscapes were identified to be a contributing factor to low adaptive capacity of the rural folks. Degraded farms and landscapes are characterized by erosion, depletion of land cover and encroachment of riparian and forest lands. Communities relying on forests to obtain goods and services suffer greatly when the ability of the same forest to supply these products is diminished. The herbalists and cultural practitioners who obtain herbs for food and medicine suffer greatly making the elderly to be highly affected.

Conserve landscapes have been identified as carbon sinks and embraced by international agencies notably the United Nations who have launched a campaign dubbed the “UN decade of Ecosystem Restoration”. This campaign aims at restoring selected degraded key landscapes to near original states by the year 2030. The PCRA exercise identified the following priority actions to promote restoration:

i. Gulley rehabilitation;
ii. Agroforestry;
iii. Reforestation;
iv. Riparian land restoration and conservation;
v. Road reserves re-greening;
vi. Use of alternative sources of fuel to reduce pressure on forests;
vii. Promotion of nature based enterprises such as tree nurseries and beekeeping;

viii. Ecotourism to promote biodiversity conservation and reduce human-wildlife-conflict.

3.7 Improvement of Preventive and Curative Healthcare

Healthcare is a major intervention to the risk of human diseases which are triggered by changes of climate. Some of the ailments are due to food scarcity in times of drought such as malnutrition, diarrhea and amoeba due to contaminated water sources. On the other hand, when flooding occurs other diseases such as bilharzia and malaria are prevalent calling an action towards either preventive or curative approaches. The most affected groups are children, pregnant women, elderly and terminally ill. The interventions include;

i. Increasing the number of community health workers to carry out sensitization on how to take care of lifestyle diseases
ii. Employing more medical staff and also equipping the health facilities

3.8 Adoption of Clean Energy

There are different sources of energy used for both domestic and commercial purposes and this has an effect on carbon dioxide emissions which is a major greenhouse gas. The communities rely on firewood and charcoal for cooking and their impact on the environment can be reduced by reducing their consumption. Some of the commonly used methods are use of improved cooking stoves, use of biogas to reduce methane emission at the same time reducing pressure on forests and farmlands. Schools use a lot of fuelwood and their switch to biogas will go a long way to reducing pressure on trees on farms and forests.

The county government in the last decade has developed many water infrastructures whose efficiency and sustainability is affected by the source of energy, mainly diesel powered generators and pumps. The community identified solarization of water projects as a good intervention while at the same time encouraging small-scale irrigation farmers to adapt to solar pumps and also use the same energy to light their homes. This is a mitigation strategy that focuses on reducing carbon emissions and if done with many water projects will greatly contribute to reduced greenhouse gasses emission.

3.9 Pollution Control and Compliance

The PCRA process identified an emerging risk of pollution due to urbanization and population growth. The pollution sources are both from domestic and urban waste in both liquid and solid forms. The water harvesting infrastructure, rivers and streams receive raw waste from overflowing septic tanks, soak pits and latrines. This predisposes the community to waterborne diseases posing a major climatic risk of human diseases. On the other hand, urban centres generate a lot of solid waste whose management has been exacerbated by lack of well managed dumpsites. The actions proposed to deal with pollution of all forms are:

i. Sensitization of communities on safe disposal of waste;

ii. Promotion of waste reuse, recovery and recycling technologies;
iii. Enforcement of existing laws prohibiting careless handling of waste by activation of polluter-pays principle approaches.

CHAPTER FOUR: IMPLEMENTATION MECHANISMS

4.1 Enabling Factors

4.1.1 Mainstreaming Climate Action Plan in the CIDP

The Makueni Climate Change Action Plan will be mainstreamed in CIDP 2023-27 and in all development programmes for consistency in implementation of identified adaptation and mitigation strategies. The government established the County Climate Institutions established the County Climate Change Unit andClimate Change Committees for a clear climate change mainstreaming mandate. In addition, Climate Change adaptation and mitigation solutions have been mainstreamed across the six county sectors such as proposals for increasing carbon sinks, promotion of the use and generation of renewable energy, climate smart agriculture, community training and widespread mobile-based dissemination of relevant climate information.

4.1.2 Multi-Stakeholder Participation Processes

Multi-stakeholder participation is a key enabling factor in the Makueni County Climate Change Action Plan and it is mainly designed to engage and involve various stakeholders from different sectors of society in the developments, implementation, and evaluation of the plan. The aim is to ensure that a wide range of perspectives, expertise, and interests are considered, and that the resulting plan reflects the needs and priorities of the local community in the county. Some of the key elements and steps involved in multi-stakeholder participation processes:

1) **Identifying stakeholders**: The first step is to identify and map out the key stakeholders who have an interest and influence in Climate Change issues within Makueni County. This may include County government line departments such as Agriculture, Livestock, Health, Water and sanitation, Finance and Infrastructure. National government agencies that work closely with the climate change unit are Kenya Meteorological Department, NEMA, National Drought Management Authority (NDMA), Kenya Forest Service (KFS), and KEFRI among others. Local businesses, community groups such as Ward Climate Change Planning Committees, academic institutions e.g. SEKU, non-governmental organizations (NGOs) and CBOs, indigenous communities, and residents.

2) **Establishing a coordinating body:** The Makueni County Climate Change Fund Board acts as the coordinating body with support of the Climate Change Unit that is the secretariat. The Climate Change Actions are coordinated through established institutional frameworks provided for in the Makueni Climate Change Act 2022. These are the Steering Committee, County Climate Change Planning Committee, Ward Climate Change Planning Committee, which coordinate the climate change action and projects at different levels. The representatives from various committees are formed to oversee the participation process.

   This body is responsible for guiding the development of the action plan, ensuring inclusive representation, and facilitating effective communication among stakeholders.
3) **Stakeholder engagement strategies:** A range of strategies were employed to engage the stakeholders throughout the climate change action planning process. These included public consultations, workshops, focus group discussions, online surveys, interviews, and targeted outreach efforts. The objective was to provide multiple opportunities for stakeholders to contribute their ideas, knowledge, and concerns.

4) **Sharing information and capacity building:** Stakeholders need access to relevant information and resources to effectively engage in the planning process. The coordinating body facilitated knowledge sharing by organizing training sessions, and offering technical support. This helped stakeholders to understand climate change impacts, mitigation strategies, and adaptation measures specific to the county.

5) **Collaborative decision-making:** Meaningful participation involved stakeholders in decision-making processes. The coordinating body fostered collaboration and consensus building among stakeholders at all levels by creating platforms for dialogue and deliberation in the county. This involved a Technical Working Group focused on specific topics, where stakeholders shared their expertise, proposed solutions, and jointly developed recommendations for the plan.

6) **Drafting the action plan:** Based on the inputs received from stakeholders through Participatory Climate Risk Assessment by all coordinating bodies, with the support of technical experts, the first draft of the County Climate Change Action Plan was developed. This plan outlines the goals, objectives, strategies, and specific priority actions to address climate change challenges within Makueni County. The draft plan was shared with stakeholders for their review and feedback.

7) **Plan implementation and monitoring:** Upon finalization of the action plan, the stakeholders continued to play a crucial role in its implementation. This involved specific working groups and committees responsible for overseeing the execution of different actions. Regular monitoring and evaluation processes were established to assess progress, identify barriers or gaps, and adapt strategies as needed. Stakeholders' feedback and contributions helped shape ongoing initiatives.

8) **Communication and transparency:** Throughout the process, transparent communication channels are maintained to keep stakeholders informed about the progress of the action plan. Regular updates, public reports, and feedback mechanisms were established to ensure accountability and trust among all stakeholders involved.

4.1.3 County Climate Change Fund

The County Climate Change Fund serves as a pool of financial resources that is allocated towards various projects and programs aimed at mitigating and adapting to climate change. This fund is typically financed through a combination of public and private sources, including government budgets, grants such as Climate Change Institutional Support by World Bank, donations, and other innovative financing mechanisms.

As an enabling factor, the County Climate Change Fund contributes to the successful implementation of the action plan in several ways:

1) **Mobilizing Resources:** The fund provides a mechanism to pool and mobilize financial resources necessary to implement climate change initiatives. It ensures a

dedicated and consistent flow of funds, enabling the county to undertake projects and programs effectively.

2) **Project Implementation:** The availability of dedicated funding allows the county to initiate and execute climate change projects. These projects may include climate investments, climate-smart agriculture, ecosystem restoration, public transportation enhancements, and other climate-related activities.

3) **Capacity Building:** The County Climate Change Fund can also allocate resources for capacity building activities. This may involve training and education programs, workshops, research, and development activities to enhance the county's expertise and knowledge in addressing climate change challenges.

4) **Leveraging Additional Funding:** The existence of Makueni Climate Change Fund helps attract additional financial resources from other sources. The county leverages the availability of funds to access grants, loans, and investments from national and international climate finance mechanisms.

5) **Accountability and Transparency:** The establishment of a Makueni Climate Change Fund promotes financial accountability and transparency.
6) It ensures that funds are managed effectively, with clear reporting mechanisms and monitoring systems in place to track the utilization and impact of resources.

4.1.4 Governance - County Government Structures

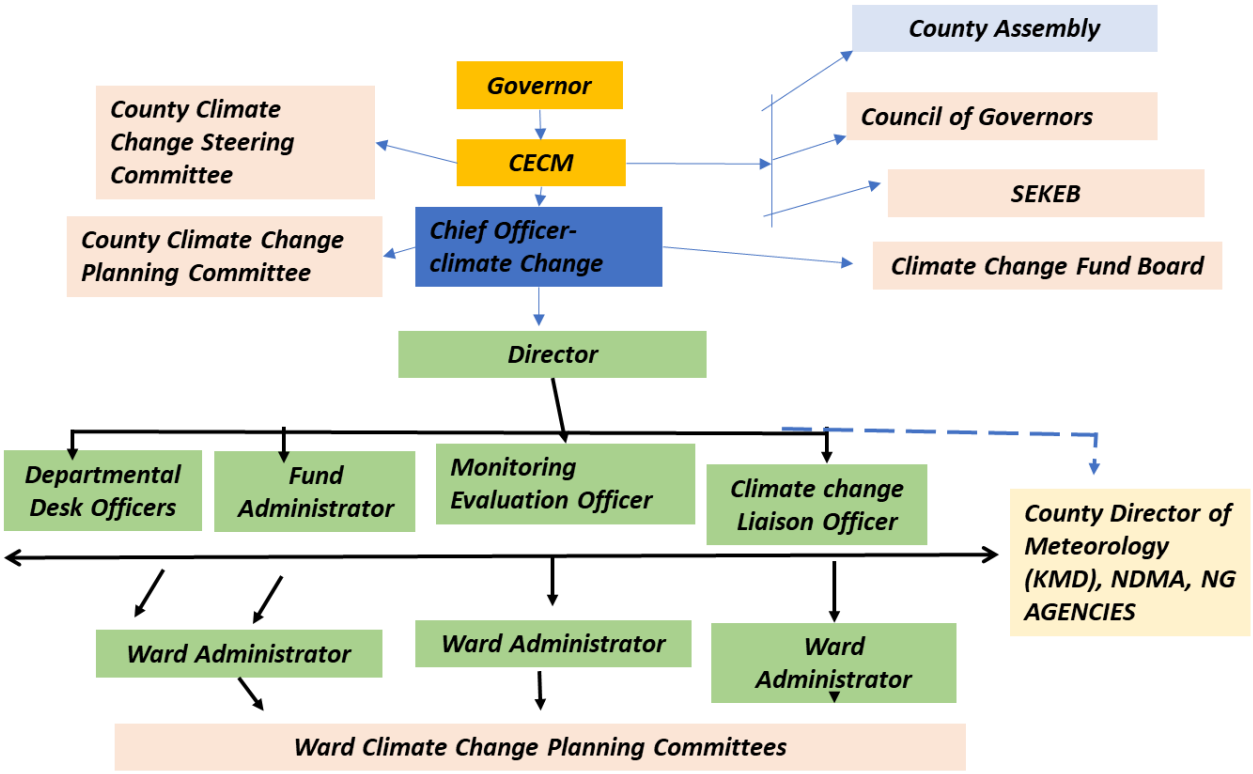

Figure 17: County Government Structure

The County Government structure as illustrated above is headed by the Governor whose mandate is to give policy directions on climate actions in the County. The County Assembly allocates, approves the County Climate Change Fund, and oversights the climate actions in the County. The Makueni Climate Change 2022 has established climate change Governance as follows;

1) The County Environment Committee Member in charge of Climate Change oversees and coordinates climate actions in the County, serves as the chairperson of the County Climate Change Steering, links the County Executive with County Assembly, the South Eastern Kenya Economic Block.
2) Climate Change Steering Committee composed of County Executive Committee Members whose mandate is oversight and coordination of climate actions in the County

3) The County Climate Change Fund Management Board is mandated to manage the planning and execution of the Climate Change Fund including resource mobilization for climate action funding
4) The Chief Officer in charge of climate change chairs the Climate Change Planning Committee which is composed of technical Directors from relevant departments. The Planning Committee
5) Climate change unit headed by Director in charge of Climate Change with a role of implementation of climate actions and is composed of technical officers. The Climate Change Unit incorporated Technical Desk Officers from different departments relevant in Climate Action. The climate Change unit roles are carrying out Participatory Climate Risk Assessment and Develop County Climate Action Plan.
6) Ward Climate Change Planning Committee at the ward level

4.1.4.1 Governance - Climate Change Planning Committees

The County government of Makueni has an established 14-member Climate Change Planning committee as stipulated under section 21 of the Makueni Climate Change Act of 2022. The composition is as follows: Chief Officer chairing with Directors from County departments responsible for finance and Planning as Vice Chairperson. Other members are drawn from the Water sector and Agriculture. The Ward committees are represented here by nominees from the WCCPC as per the guidelines nominated by ECM responsible for Climate Change. National government entities represented in this committee are County Director Meteorological services and County Director Drought Management Authority. In the interest of working with vulnerable groups, two representatives of youth, women groups, persons living with disability, faith based organizations, representatives of farmers and relevant NGOs. The roles of this committee are to:

(a) Coordinate planning and implementation of projects for climate change response;
(b) Coordinate implementation of County Climate Change Action plan (CCCAP) and financing framework;

(c) Establish guidelines for WCCPC in formulation of climate change response projects for funding;

(d) Support WCCPCs in development and implementation of climate response projects;

(e) Coordinate development and implementation of county climate fund regulations;

(f) Advise the steering committee on various relevant action priorities;

(g) Formulate and implement strategic actions to foster climate change education

(h) To coordinate research and knowledge management on climate change impacts and strategies and responding to them;

(i) Prepare and disseminate an annual report on climate change response activities;

(j) Formulate and implement a county monitoring, evaluation and reporting framework for climate change response;

(k) Consolidate ward climate change response reports;

(l) Perform other duties assigned to them by the County Climate Change Steering committee.

4.1.5 Climate Information Services & Climate Data Access

4.1.5.1 Climatic Conditions

Makueni county is largely an Arid and Semi-Arid Land (ASAL); prone to frequent droughts due to unreliable and erratic rainfall. The county experiences two rain seasons in a year. The long rains are experienced during the March-April-May season with the volume of rainfall averaging at 140 MM over the last five years. Short rains are experienced during the October-November-December season with higher volumes of precipitation being realized with a five-year average of 300MM. The mean annual temperatures in Makueni range from 22.7 Degrees Celsius to 24 Degrees Celsius over the last 5 years.

4.1.5.2 General Use of Climate Information

Climate, which is average weather conditions for a particular location over a long period of time typically over 30 years is a resource to be exploited for prosperity but at the same time it is a risk to be managed. KMD supports climate policy-making by advising different stakeholders on climate change mitigation and adaptation and on societal impacts of climate change.

The World Meteorological Organization (WMO) under which all National Meteorological and Hydrological Services (NMHSs) such as KMD falls, coordinates scientific research in order to provide better and more up-to-date climate information to enable decision-making to make more informed conclusions as to the causes of and impacts of climate change and to develop appropriate response strategies in all regions of the world. It coordinates the study of the climate, its variations, extremes and changes over the past, present and the future.

In collaboration with other agencies KMD supports the study of climate impacts on a variety of socio-economic sectors to support evidence-based decision-making on how to best manage the risks of climate variability and to adapt to a changing climate, to ensure human safety and well-being. Climate information is essential for climate-smart decision-making at all levels to deal with climate risks. Climate information is also essential for monitoring the success of adaptation and mitigation efforts such as reduction of GHG emissions that contribute to

climate change, as well as for promoting efforts to increase energy efficiency to transition to a carbon-neutral economy and effectively pursue Sustainable Development Goals (SDGs).

At the county level, the County Meteorological Office generates meteorological products tailored to meet different stakeholders' needs to guide decision-making for various sectors in order to ensure that sectoral decisions are made based on information

4.2 Relevance of Climate Information Under FLLoCA

The climate of a place is part of the natural endowment of that place. In some regions it imposes hardships on the inhabitants, in others it makes life easy. Designs of living adapted to the climate of each region are the results of the accumulated experience and knowledge of generations. Generally, climate is a friendly element that requires only to be understood in order to become useful, but in regions of extremes, it is a risk to be managed (If the climatic risks of a place are too high i.e. Very harsh climatic conditions, that people in that place cannot adapt to), they are relocated by governments.

A County like Makueni which has different climates for different wards, can greatly exploit the climate resources of those wards for their socio-economic growth and development. Climate is a natural resource on which all other natural resources rely on. In contrast to the other resources which are exhaustible, climate resources are inexhaustible. While the individual day-by-day weather conditions change constantly, climate remains fairly constant and this makes it possible to treat climate as a calculable risk. Whenever climatic conditions of a place are adequately known and described, they can be intelligently integrated into plans for all kinds of human activity (All human endeavors require information on weather, climate and water – Hydro-meteorological information).

Climate is the determinant of livelihood activities in each location. Good administration of an estate starts with the knowledge of assets and liabilities; therefore, a comprehensive inventory is the prerequisite for proper use of climate. Climate can be considered a resource for agriculture and forestry as certain climates are more favorable for growing certain crops and trees. It is also a resource for tourism as certain climates are more conducive for certain types of vacations or outdoor activities.

Climate can also be considered a resource for energy production, as certain climates are more conducive for certain types of renewable energy production such as wind and solar power. However, it is also very important to note that climate change can negatively impact these resources and so it is important to take steps to mitigate and adapt to climate change in order to protect these resources for future generations and ensure comfort for the current generation.

4.3 Resilience Planning Tools

Tools used for resilient planning help decision-makers identify their local climate threats and vulnerabilities and reduce their risks from impacts of climate variability and change. Efforts towards building community resilience requires planners and experts to understand important climate data and technology tools to help communities prepare for future and present threats to people and assets, and to understand how vulnerable communities will be impacted.

The tools help decision-makers identify the local climate threats and vulnerabilities and reduce their risks from impacts of climate variability and change. The tools include:

4.3.1 Resource Maps.

Resource maps are tools used to map natural and artificial resources available in communities. Resource mapping is a strategy for identifying and analyzing the programs, people, settlements, services, and other natural and artificial resources that currently exist in a particular community. During the assessment, resources in the different wards of the county were mapped with the help of existing maps. During the engagements, stakeholders named and described various resources such as water sources including rivers, Earth dams, sand dams, rock catchments amongst others, Markets, major roads, schools and other resources.

4.3.2 Hazard Assessment

The terms "hazard" and "risk" are often used interchangeably. In the context of a hazard assessment, however, the two have separate meanings. A hazard refers to a situation that exposes people to potential injury or illness. Risk, on the other hand, refers to the probability that the people become sick or injured due to a hazard. A hazard assessment is a procedure and tool designed to identify, assess, and manage health risks and safety hazards in the workplace. It also recommends appropriate safety measures to use to mitigate the identified hazards.

Hazard assessments can be a detailed and thorough process or it can be as simple as following through a checklist or visually inspecting a living/settlement area. The purpose of a hazard assessment is to minimize the risk of illness or injury by identifying as many hazards as possible and implementing controls to reduce the likelihood of an adverse event. During the

PCRA exercise, current and historical hazards were explored. Stakeholders were able to narrate lived experiences of the hazards and their impacts on the people. They also identified factors that build resilience of local production and livelihood systems and factors that undermine them. Hazard ranking tools were used to assess and rank the hazards in terms of severity and impact to the community. The risk assessment was done in order to:

1. Create awareness of hazards and risk.
2. Identify who may be at risk
3. Determine whether a control program is required for a particular hazard.
4. Determine if existing control measures are adequate or if more should be done.
5. Prevent injuries or illnesses, especially when done at the design or planning stage.
6. Prioritize hazards and control measures.

4.3.2 Vulnerability Assessment

Climate Change Vulnerability is the susceptibility of a species, system or resource to the negative effects of climate change and other stressors, and includes three components: exposure, sensitivity, and adaptive capacity: Climate Change Vulnerability Assessments (CCVAs) is therefore used as an initial step in the adaptation planning process and focuses on individuals, households and groups of interest. It helps identify the greatest risks to them from climate change impacts. A CCVA identifies factors that contribute to vulnerability, which can include both the direct and indirect effects of climate change, as well as non-climate stressors such as land use change, habitat fragmentation, pollution, and invasive species.

4.4 Institutional Roles and Responsibilities

Table 11: Roles and responsibilities

Institutions	**Roles/ responsibilities**
Makueni County Climate Change Fund Board	● Oversight to Climate Change Unit ● Resource mobilization ● Climate financing ● Climate-resilient planning

	• Monitoring and evaluation
Makueni County Assemblies	• Enactment of relevant laws and legislation • Oversight function • Adoption of climate change action plan
County Executive	• Approval of the County Climate Change Action plan
County Climate Change Unit (CCCU)	• Oversee and implement climate actions • Facilitate and coordinate planning and budgeting for County Climate Change Fund • Organize and facilitate community level participatory vulnerability and capacity assessment. • Facilitate and support ward -level climate risk vulnerability and capacity assessments • Facilitate and support ward-level consolations for the annual Climate Change Action Plans
Ministry of Environment and Forestry, CCD and NEMA	• Promote the integration of environmental considerations into development policies, plans, programs and projects. • Identify projects and programs for which environmental audit and monitoring must be conducted • Monitoring and assessing activities conducted.
Ministry of Labor and Social Protection, including the Directorate of Occupational Safety and Health Service(DOSHS)	• Social protection policy • Community mobilization • Protection and advocacy of needs of persons with disabilities
National Drought Management Authority	• Resilience building in the entire PCRA process.

National Treasury and Planning	● Strengthen financial and fiscal relations between national government and county government ● Mobilizing domestic and external resources ● Assist county governments to develop their capacity for efficient, effective and transparent financial management.
Kenya Meteorological Department(KMD)	● Provision of Climate Information for guiding sectoral planning

4.5 Implementation and Coordination Mechanisms

4.5.1 Coordination Mechanism

The Makueni County Climate Change Action Plan (2023 – 2027) prioritizes climate actions in the County to achieve low carbon climate resilient development. It provides county prioritized actions and a road map for the necessary enabling conditions for Development Partners and other Stakeholders to support climate actions in the County. The Climate Change Steering Committee will ensure the prioritized climate actions in the County Climate Action Plan are mainstreamed in the county planning and budgeting. The committee is obligated to review, adopt and oversee the implementation of the Action Plan. Climate Change Fund Management Fund will ensure equity in resource allocation for prioritized climate actions, mobile resources, monitor resource allocation and climate actions implementation.

4.5.2 Implementation Mechanism

The Climate Change Planning Committee will mainstream the relevant Climate Action plans in the County Departments and the County planning and Budgeting Process. The County Climate Change units will implement the County Climate Action Plan in coordination with the development partners, National Government Agencies, Non- Governmental Organizations, Civil Society Organizations. At Ward level the Ward Climate Change Planning Committee will implement and coordinate the ward climate action priorities in coordination with other stakeholders at the Ward Level.

4.6 Resource Mobilization

The climate change resource mobilization strategy will involve both internal and external mobilization. The internal strategy will focus on enhancing the county's allocation to climate change programme while the external strategy will involve engaging external partners to finance implementation of the action identified under the climate change programmes. The government will ensure deepened engagement with Bilateral and Multilateral agencies, Public Private Partnerships, Private Foundations, development partners and Diaspora Engagement Forums. The government will enhance its strategic collaboration with the National Government Departments and Agencies to fund the key priority interventions identified in the implementation matrix and ensure comprehensive community contribution.

This will enhance citizen engagement by ensuring communities are active participants in climate change adaptation and mitigation strategies. This will ensure communities contribute directly towards implementing the prioritized CCAP objectives.

4.7 Implementation Matrix

Table 12: Implementation matrix

Strategic Objectives	**Priority Action**	**Expected Outcome/Output**	**Key Performance Indicators**	**Targets**	**Targets**
				2023-25	**2025-27**
Water Sector					
Increase access to water for irrigation and domestic use	Promotion of water harvesting at HH level	Increased access to potable water	% of HHs accessing potable/safe water	50	70
			No. of HH with roof catchments	30,000	60,000
	Construction of water	increased volume of	Average distance in Km to water points	5	2.5

	infrastructures (earth dams, earthpans rock catchments and sanddams)	water for domestic, livestock and agricultural use all year round	No. of large dams constructed of ≥ 750,000M3 complete with treatment system, distribution and irrigation infrastructure	1	2
			No. of medium sized dams of 500,000M3 constructed/ desilting/ expansion/ rehabilitated	3	5
			No. of small dams of 50,000M3 & < 500,000M3 constructed/ desilting/ expansion/ rehabilitated	15	30
			% rural HH with piped water	70%	80%
			No. of sand dams/Weirs with Sumps and green energy constructed/rehabilitated	5	10
			No. of rock catchments constructed with storage, treatment and distribution	3	6

			% of water facilities with green/solar pumping systems	25%	50%
			% of water catchment areas protected and conserved	30%	60%
			No. of sensitization forums on catchment conservation	300	600
			No. of sensitization forums on water conservation	300	600
	Water treatment	Reduced water borne diseases	No. of community water sources with water treatment	5	10
			No. of sensitization forums on water treatment	300	600
			% of water facilities with environmental and social safeguards (ESIA/EIA/GRM)	30%	50%
			% of compliance to Makueni County Water Act	40%	80%
Agricultural Production					

			No. of irrigation zones established/rehabilitated	2	4
			No. of farms under irrigation	500	1000
			Acreage under irrigation	10,000	20,000
			No. of farm ponds constructed with liners and Pumping systems	50	100
			% increase in HH with farm ponds	2%	5%
	Promotion of modern Agricultural technologies		No. of people adopting Climate Smart Agriculture and Conservation Agriculture	50000	100,000
			No. of farmers accessing subsidized farm inputs	10,000	20,000
			No. of farmers trained on climate smart agricultural technologies	50000	100,000
			Length in KM of soil conservation structures	400	800

			No. of HH's adopting conservation structures	2000	4000
	Integrated Soil and Fertility management (ISFM)	Increased agricultural production	No. of HH with farms tested of soil fertility	500	1000
			No. of farmers trained on ISFM	1000	3000
	Reduction of losses from agricultural production	Reduced crop loses	No. of farmers enrolled in crop insurance programme	2000	4000
			No. of wards pest and disease free zones	1	2
			No. of farmers trained on integrated pest and disease control	5000	10000
			No. of farmers accessing subsidized farm inputs	1000	2000
	promoting use of technology in agricultural productivity	increased agricultural productivity,	No. of farms using improved technologies	5,000	20,000
	Training and extension	Increase in agricultural productivity and	% increase productivity for targeted crop value chains	5	30

		knowledge base			
	Marketing and value addition	Increase access to aggregation centers	No. of aggregation centers established	60	90
		Increase access to certified aggregation centers	No. of certified ware house receipt system	0	3
		Increase access to processing enterprises	% increase in Quantity of agricultural produce processed	5	20
Livestock Production					
increased livestock production and productivity	Rangeland and pasture management	Increased pasture production	No. of farmers supplied with pasture seeds	1000	2000
			Acreage of land under pasture development	5000	10000
			No of farmers trained on range/pasture management	5000	10000
	Breed improvement	Increased productivity	No. of subsidized AI given	1000	2000

			No. of farmers with improved breeds	20000	30000
			No of farmers trained on breed improvement	5000	10000
			No. of inseminators	30	60
	Disease and pest control		No. of farmers accessing subsidized farm inputs	16000	50000
			No. of livestock vaccinated	100,000	200,000
			No. of mobile livestock labs conducted	10	60
			status of development of a vet handbook	1	1
			No. of farmers reached/Benefitted on pest and disease control programs	15000	30000
		Increase access to processing enterprises	% increase in Quantity of agricultural produce processed	5	20
Landscape Restoration and Human Wildlife Conflicts					
			No. of Kms of terraced	300	500

To restore degraded forest and landscapes	Farmland and range land restoration	Restored landscapes	No. of gulleys rehabilitated	3	6
			No of HH adopting agroforestry	50000	80000
			Acres reseeded with appropriate grass species	600	1000
			No of nature based enterprises established	22	40
	Forest restoration	Increased forest cover and tree cover	No. of Tree seedlings planted and surviving (‘000’)	2,500	4,500
			No of forests surveyed, beaconed and protected	3	5
			No of CFAs formed and strengthened	6	12
			No of PFMP developed and implemented	6	12
			No of Hectares under forest planted	100	200
			No of forests with established nature trails	1	2
			No nature based enterprises identified	1	6

			and promoted in the forests		
			No of forests with nature based activities	1	3
			% increase in tree cover	0.5	2
			% increase in forest cover	0.1	0.4
	Wetland and Riparian reserves restoration	Restored riparian reserves	No of wetlands Gazetted	2	4
			No of wetlands restored, protected and conserved	1	2
			area (Ha) of wetlands restored	20	50
			No. of KM of rivers conserved	50	100
			No of sand dams construction	5	10
			No of earth dams conserved	10	20
			No of WRUAs formed and strengthen	2	3
			No of SCMPs prepared and implemented	2	3

		Demarcated rivers	No of rivers pegged	6	12
	Road reserves restoration	Reduced road runoff	No of roads with roads for water	5	15
			No of HH benefiting from roads for water program	500	1,000
	Germplasm /Seedlings propagation	Established and operational tree nursery groups	No of tree nurseries groups established and strengthened	5	10
		Raised variety of quality seedlings	No of seedlings grown	2,000,000	3,500,000
To reduce wildlife conflicts and promote human-wildlife coexistence	Wildlife Conservation	Reduced conflicts and conserved wildlife	Kms electric fence done	60	120
			No of established and protected wildlife corridors	3	5
			No of water infrastructure developed in the parks	5	10
			No. of animals translocated from farmlands to protected areas	100	100

			No. of claim forms processed and settled per year	50	80
			No of people sensitized on wildlife management and human wildlife coexistence	50,000	100,000
	Eco-tourism	Improved livelihoods	No nature-based enterprises (establishment of conservancies, ecologies, tented camps, game drive, picnic sites, tourist attraction sites)	1	2
			No of established community game farm	1	1
			No of visitors per year visiting the nature based facilities	200000	400000
Human Diseases					
Improve preventive and curative health care	Promotion of preventive healthcare	Increased access to preventive healthcare	No. of households receiving routine visits by Community health workers/volunteers	1000	2000

			No of sensitization forums on GBV	150	300
Energy					
increase uptake of renewable energy	Promotion of clean energy technologies at household level	Adoption of solar lighting in homes	No. of Households using solar lighting	50,000	100,000
		Households adopting to clean cooking technologies	No. of HHs using improved cooking technologies	40,000	80000
	Promotion of clean energy sources for commercial production	reduced overreliance on biomass energy	No. of institutions (schools, hospitals) taking up use of biogas as source of cooking energy	200	400
Pollution Control And Management					
Promotion of hygiene and sanitation best practices	Creation of an enabling environment for pollution control	Legal structures promoting sustainable environmental management	No of policies formulated	1	1
			No of acts enacted on environmental management	1	1

		Enhanced knowledge on environmental management	No of sensitization forums done	60	120
		A clean environment	No of established legal dumpsites	6	6
	Promoting sustainable environmental management	clean and healthy environment	No of markets under market cleaning programme	150	200
			No. of pollution incidents reported, investigated and managed	5	10
			No. of environmental inspections carried out	10	20
			No of officers deployed on pollution control	2	4
			No of water, air and soil quality analysis done	5	10
	Enforcement of relevant environmental management laws		No of cases handled on pollution	5	5
Climate Information Systems					

Reducing vulnerability to climate risks	development and dissemination of climate/weather data	data based decision making	No. of climate information systems developed	1	1
			No. of farmers receiving Climate information	5,000	10,000
			No. of early warning systems disseminated	2	2

CHAPTER FIVE: BUDGET

5.1 Financial Plan

Table 13: Financing Plan

Strategic Objectives	Priority Action	Expected Outcome /Output	Key Performance Indicators	Targets	Targets	2023		2024		2025		2026		2027		Cummulative Budget per KRA
				2023-25	2023-27	Target	Budget	Target	Budget	Target	Budget	Target	Budget	Target	Budget	
Water Sector																
Increase access to water for irrigation and domestic use			No. of large dams constructed of ≥ 750,000M3	1	2	0	0	0	0	1	375	0	0	1	375	
			No. of medium sized dams of 500,000M3 constructed/ desilting/ expansion/ rehabilitate	3	5	1	250	1	250	1	250	1	250	1	250	

	Construction of water infrastructures (earth dams, earthpans rock catchments and sanddams)	increased volume of water for domestic, livestock and agricultural use all year round	No. of small dams of 50,000M3 & < 500,000M3 constructed/ desilting/ expansion/ rehabilitated	15	30	2	250	6	750	7	875	7	875	8	1000	
			No of water infrastructure installed with green energy power system	3	5	0	0	1	7	1	7	1	7	1	7	
			No. of sand dams/Weirs with Sumps	5	10	2	30	2	30	2	30	2	30	2	30	
			No. of rock catchments constructe	3	6	1	15	1	15	1	15	1	15	1	15	

			d with storage													
			No. of sensitization forums on catchment conservation	300	600	120	3	120	3	120	3	120	3	120	3	
			No. of sensitization forums on catchment conservation	300	600	120	3	120	3	120	3	120	3	120	3	
	Water treatment	Reduced water borne diseases	Treatment system installed in water insfrastructure	4	7	1	10	1	10	2	20	1	10	2	10	
						247	**561**	**252**	**1068**	**255**	**1578**	**253**	**1193**	**256**	**1693**	**6093**
Agricultural Production																
	Irrigated Agriculture	Increased agricultural production and	No of irrigation system/infrastructure established	4	7	1	50	1	50	2	100	1	50	2	100	

		productivity	No. of farm ponds constructed with liners and Pumping systems	50	100	0	0	20	40	20	40	30	60	30	60	
	Promotion of modern Agricultural technologies	Climate Smart Agriculture	No. of sensitization fora on Climate Smart Agriculture and Conservation Agriculture/ISFM	300	600	120	3	120	3	120	3	120	3	120	3	
			Length in KM of soil conservation structures	400	800	0	0	200	30	200	30	200	30	200	30	
	Reduction of losses from agricultural	Reduced crop loses	No. of farmers enrolled in crop insurance programme	2000	4000	0		1000		1000		1000		1000		

	production		No. of wards pest and disease free zones	1	2			1	5			1	5			
			No. of farmers trained on integrated pest and disease control	5000	10000	0	0	2500	1	2500	1	2500	1	2500	1	
	Marketing and value addition	Increase access to aggregation centers	No. of aggregation centers established	30	60	0		15	225	15	225	15	225	15	225	
Sub Total						**121**	**53**	**3857**	**354**	**3857**	**399**	**3867**	**374**	**3867**	**419**	**1599**
Livestock Production																
increased livestock production and productivity	Rangeland and pasture management	Increased pasture production	No. of Kgs of pasture seeds supplied	1000	2000	0	0	500	3	500	3	500	3	500	3	
			No of farmers trained on range/pasture management	5000	10000	0	0	2000	12	2000	12	2000	12	2000	12	

	Breed improvement	Increased productivity	No. of subsidized AI given	1000	2000	200	0.15	300	0.23	300	0.23	600	0.5	600	0.5	
			No of farmers trained on breed improvement	5000	10000	0	0	2000	12	2000	12	2000	12	2000	12	
			No. of inseminators trained	30	60	0	0	15	1	15	1	15	1	15	1	
	Disease and pest control		No. of livestock vaccinated	100,000	200,000	10000	1	40000	4	60000	6	40000	4	50000	5	
			No. of mobile livestock labs conducted	10	60	0	0	5	1	10	2	15	3	30	6	
			Status of development of a vet handbook	1	1	0	0	0	0	0	0	0	0	1	3	
Sub Total						**10200**	**1.15**	**44820**	**33.23**	**64825**	**36.23**	**45130**	**35.5**	**55146**	**42.5**	**148.61**
Landscape Restoration and Human Wildlife Conflicts																
To restore degrad	Farmland and range	Restored landscapes	No. of Kms of terraced	300	500	0	0	100	15	100	15	150	22.5	150	22.5	

ed forest and landscapes	land restoration		No. of gulleys rehabilitated	3	6	1	1.5	1	1.5	1	1.5	1	1.5	1	1.5	
			No of nature based enterprises established	22	40	0	0	10	10	10	10	10	10	10	10	
	Forest restoration	Increased forest cover and tree cover	No. of Tree seedlings planted and surviving	2500000	4500000	500000	40	1000000	80	1000000	80	1000000	80	1000000	80	
			No of forests surveyed, beaconed and protected	3	5	0	0	1	1.5	2	3	1	1.5	1	1.5	
			No of CFAs formed and strengthened	2	5	1	2.5	1	2.5	1	2.5	1	2.5	1	2.5	
			No of PFMP developed and	2	5	1	4	1	4	1	4	1	4	1	4	

			implemented													
			No of Hectares under forest planted	100	200	20	2	20	2	40	4	40	4	100	10	
			No of forests with established nature trails	1	2			0	0	1	3	0	0	1	3	
			No nature based enterprises identified and promoted in the forests	1	5	0	0	1	2	1	2	1	2	2	4	
	Wetland and Riparian reserves restoration	Restored riparian reserves	No of wetlands Gazetted	2	4	0	0	1	3	1	3	1	3	1	3	
			No of wetlands restored, protected and conserved	1	4			1	10	1	10	1	10	1	10	
			area (Ha) of	20	50	0	0	10	3	10	3	10	3	20	6	

			wetlands restored													
			No. of KM of rivers conserved	50	100	0	0	25	5	25	5	25	5	25	5	
			No of sand dams constructio n	5	10	2	6	2	6	2	6	2	6	2	6	
			No of earth dams conserved	10	20	2	8	3	12	3	12	6	24	6	24	
			No of SCMPs prepared and implement ed	2	3	0	0	0	0	1	2	1	2	1	2	
		Demarcat ed rivers	No of rivers pegged	6	12	0	0	3	2.4	3	2.4	3	2.4	3	2.4	
	Road reserves restorati on	Reduced road runoff	No of roads with roads for water programm e structures	5	15	0	0	3	2	3	2	3	2	3	2	
	Germpl asm /Seedlin gs	Establish ed and operation al tree	No of sensitizati on forums to tree	50	150	0	0	35	2	35	2	40	2.5	40	2.5	

	propagation	nursery groups	nurseries groups established and strengthened													
To reduce wildlife conflicts and promote human-wildlife co-existence	Wildlife Conservation	Reduced conflicts and conserved wildlife	Kms electric fence done	60	120	0	0	0	0	60	120	0	0	60	120	
			No of established and protected wildlife corridors	3	5	0	0	1	2	1	2	0	0	2	2	
			No of of sensitizion forum on wildlife management and human wildlife co-existence	10	20	0	0	5	1.5	5	1.5	5	1.5	5	1.5	
	Eco-tourism	Improved livelihoods	No nature-based enterprises (establishment of conservancies,	0	1	0	0	0	0	0	0	0	0	1	10	

			ecologies, tented camps, game drive, picnic sites, tourist attraction sites)													
Sub Total						**500027**	**64**	**1000224**	**167.4**	**1000307**	**295.9**	**1000302**	**189.4**	**1000437**	**335.4**	**1052.1**
Human Diseases																
Improve preventive and curative health care	Promotion of preventive healthcare	Increased access to preventive healthcare	No. of households receiving routine visits by Community health workers/volunteers	1000	2000	250	5	250	5	250	5	250	5	250	5	
			No of sensitization forums on GBV	150	300	50	3	50	3	50	3	50	3	50	3	
Sub Total						**300**	**8**	**300**	**8**	**300**	**8**	**300**	**8**	**300**	**8**	**40**
Energy																
increase	Promotion of	Adoption of solar	No. of Sensitizati	300	600	120	3	120	3	120	3	120	3	120	3	

uptake of renewable energy	clean energy technologies at household level	lighting in homes	on forums on adoption of solar lighting													
		Households adopting to clean cooking technologies	No. of sensitization on on improved cooking technologies	300	600	120	3	120	3	120	3	120	3	120	3	
	Promotion of clean energy sources for commercial production	reduced overreliance on biomass energy	No. of green energy promotion forum to institutions (schools, hospitals) taking up use of biogas as source of cooking energy	200	400	0	0	100	5	100	5	100	5	100	5	
Sub Total						**240**	**6**	**340**	**11**	**340**	**11**	**340**	**11**	**340**	**11**	**50**
Pollution Control And Management																

Promotion of hygiene and sanitation best practices	Creation of an enabling environment for pollution control	Legal structures promoting sustainable environmental management	No of policies formulated	1	1	0	0	1	4		0	0	0	0	0	
			No of acts enacted on environmental management	1	1	0	0	1	2	0	0	0	0	0	0	
		Enhanced knowledge on environmental management	No of sensitization forums done	300	600	120	4	120	4	120	4	120	4	120	4	
		A clean environment	No of established legal dumpsites	6	6	1	2	1	2	1	2	1	2	1	2	
	Promoting sustainable	clean and healthy environment	No of markets under market	150	200	50	5	50	5	50	5	50	5	50	5	

	environmental management		cleaning programme													
			No. of pollution incidents reported, investigated and managed	5	10	2	1.5	2	1.5	2	1.5	2	1.5	2	1.5	
			No. of environmental inspections carried out	10	20	4	0.5	4	0.5	4	0.5	4	0.5	4	0.5	
			No of officers deployed on pollution control	2	4	0	0	2	5	0	0	0	0	2	5	
			No of water, air and soil quality analysis done	5	10	0	0	2	1	2	1	2	1	4	2	
Sub Total						**177**	**13**	**183**	**25**	**179**	**14**	**179**	**14**	**183**	**20**	**86**
Climate Information Systems																

Reducing vulnerability to climate risks	development and dissemination of climate/ weather data	database decision making	No. of climate information service developed	10	20	4	1	4	1	4	1	4	1	4	1	
			no of sensitization forums on climate actions	300	600	120	2.5	120	2.5	120	2.5	120	2.5	120	2.5	
			No. of early warning information disseminated	2	5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	
Sub Total						**125**	**4**	**125**	**4**	**125**	**4**	**125**	**4**	**125**	**4**	**20**
Total Budget							**710.15**		**1670.63**		**2346.1**		**1828.9**		**2532.9**	**9,088.71**

CHAPTER six: MONITORING, EVALUATION AND REPORTING

6.1 Measurement, Reporting and Verification

Through the monitoring, evaluation and learning (MEAL) framework, the Climate Change Unit and Board will be able to manage performance of the CCAP and identify variances in its implementation. The MEAL framework will bring together all county Climate Change stakeholders for the timely achievement of the envisaged impact. The MEAL framework monitoring will propose a regular strategy for CCAP review taking into consideration the internal and external factors that may affect the actualization of the targets.

The **monitoring process** shall be guided by a framework that stipulates indicator identification; indicator data; frequency of data collection; responsibility for data collection; data analysis and use; reporting and dissemination. The monitoring reports will provide the implementation process to CCU, Board, Management and the main stakeholders of the ongoing development interventions and achievement of desired quality of the climate change programmes and projects. The project management committees together with the Ward Climate Change Planning Committees will carry out daily monitoring and tracking of projects' timeliness and effectiveness of the implementation. The Ward Climate Change Planning Committees will work to protect community interests and give feedback to the County Climate Change Planning Committee within the set timelines through daily monitoring and reporting.

The **evaluation process** will be systematic and objective in assessing the quality of project designs, implementation and realization of targets and will mainly focus on whether results are being achieved or not, their relevance, effectiveness, impact and sustainability. Evaluation will be both internal and external with stakeholders participating in all phases of project implementation, reporting, feedback, dissemination and follow-up actions-taking and review. The evaluation process will interrogate implementation of climate change development activities and establish any possible risks and adjustments that require realignment to deliver the outcomes of climate change mitigation and adaptation measures.

The M&E framework will use the log frame provided during capacity building by FLLoCA to carry out monthly and quarterly field visits by technical staff and development collaborators to ensure the projects are in line with planned targets and timelines. The timelines for the

projects will vary significantly due to the nature of risks and scope of the projects. Some will take a short period while others will stretch for the whole planned period. The M&E framework will be semiannually for short period projects and annually for projects taking a year. The evaluation will also be carried out annually jointly by all stakeholders including M&E, CCU, Socio-Economic Planning & Budget Units and technical members from each respective sector to provide progress in actualizing the envisioned outcomes.