REPUBLIC OF KENYA

COUNTY GOVERNMENT OF KAKAMEGA

DEPARTMENT OF WATER, ENVIRONMENT, NATURAL RESOURCES & CLIMATE CHANGE

Participatory Climate Risk Assessment Report

May 2023

Table of contents

List of figures

List of tables

Definition of terms

The terms used in this document are definitions by the International Panel on Climate Change (IPCC).

Adaptation: Adaptation is an adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to 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: It is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences

Climate Change: Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer)

Disaster: A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources

Exposure: The nature and degree to which a system is exposed to significant climatic variations. In this document exposure is considered as the characteristics and magnitudes of climate change, climate variability and associated hazards including the extreme events to which a system is exposed

Hazard: A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage

Risk: Risk is the combination of the probability of an event and its negative consequences. The degree of risk is expressed in terms of monetary value in this document.

Sensitivity: Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate-related stimuli

Susceptibility: The state or fact of being likely or liable of a system or an element to be influenced or harmed by a particular thing or hazard (adopted from OED online)

Variability: It is the state or characteristic of a system of being variable, in this case that of the climate. In this document variability will be mostly associated with climate.

Vulnerability: It is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function

of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity

Acronyms

ADP	Annual Development Plans
ASDS	Agricultural Sector Development Strategy
CBOs	Community Based Organizations
CCCAP	County Climate Change Action Plan
CCU	Climate Change Unit
CECM	County Executive Committee Member
CGK	County Government of Kakamega
CIDP	County Integrated Development Plan
FAO	Food and Agriculture Organization
FBO	Faith-Based Organization
FLLoCA	Financing Locally Led Climate Action
GHGs	Green House Gases
IAS	Invasive Alien Species
IPCC	Intergovernmental Panel on Climate Change
KCCISP	Kakamega County Climate Information Service Plan
KDDC	Kakamega Dairy Development Corporation
KRCS	Kenya Red Cross Society
MRV+	Measurement, Reporting and Verification
NCCAP	National Climate Change Action Plan
NDCs	Nationally Determined Contributions
NEMA	National Environment Management Authority
NG	National Government

NGOs	Non-Governmental Organisations
PCRA	Participatory Climate Risk Assessment
PDS	Prolonged Dry Spell
PWDs	Persons with Disability
RCPs	Representative Concentration Pathways
SDGs	Sustainable Development Goals
TWG	Technical Working group
UNFCCC	United Nations Framework Convention on Climate Change
WASH	Water Sanitation and Health
WCCPCs	Ward Climate Change Planning Committees
WMO	World Meteorological Organization

Foreword

Climate change poses undoubtedly the greatest risk to the realization of the ideals of Sustainable Development Goals, Kenya Vision 2030 and the County Integrated Development Plan and other blueprints that push agendas aimed at poverty reduction and food security. Our County has experienced extreme weather events such as heavy rainfall, prolonged dry spell; other climate change-related hazards such as landslides, flooding, invasive species like *Cascuta dodder*, fall army worm pests, deteriorating water quality and quantity to name but a few. The major concern for the County is heightened threat to food security, deteriorating water resources, loss of biodiversity caused by increasing land degradation, deforestation and decreasing land productivity. My Six-point Agenda priorities namely Health, Sanitation and Hygiene; Wealth creation; Food security; Education; Social development, and good governance are likely to be affected by climate variability and change.

Water is a Constitutional right and therefore expected that every person should have a right to clean and safe water in adequate quantities. My Plan is clear on water provision with a slogan "Amatsi Mumuliango". Similarly, I am keen on improving access to health services through health infrastructure development and ensuring that the health facilities are upgraded, and well equipped to support service delivery.

In recognition of the wide range of ecological assets that we are endowed with, I am committed to making informed decisions in key sectors sensitive to climate to give rise to both substantial economic benefits and sustainable development. The Participatory Climate Risk Assessment (PCRA) is timely for communities to identify climate risks in their midst and innovate adaptation mechanisms to contribute to building their resilience. This has been an opportunity for incorporating climate and disaster risk considerations into community planning and development. The PCRA has strengthened our vulnerable communities' participation more than ever before in assessing their climate related risks and developing adaptation strategies for effective climate change planning within this County. As a County, we are committed to strengthening our adaptation and mitigation strategies and this is exemplified through our developed climate change legislative framework that provides a strategic direction towards climate change finance mobilization, climate information service, and institutional governance structures.

In conclusion, this PCRA report will unlock access to innovative climate finances; establish a link between climate information services and the CIDP to inform needed concrete actions. This will enhance partnership through recognizing the strength of diverse stakeholders within the County with focus on the participation of vulnerable groups.

H.E. Hon. FCPA Fernandes O. Barasa, OGW.

Governor Kakamega County.

Acknowledgement

The Kakamega Participatory Climate Risk Assessment report was prepared with the spirited participation and support of several stakeholders who contributed immeasurably in ensuring the completion of the process. These include among others the Multisectoral Technical working Group, Climate Change Unit, staff of the County Department of Water, Environment, Natural Resources, and Climate Change, as well as other related County Government Departments and Agencies, Civil Society Organizations, Non-Governmental Organizations, development partners, the County Assembly of Kakamega, particularly the County Assembly Committee on Water, Environment and Natural Resources, under whose mandate the Kakamega Climate change Action Plan was approved. To all these esteemed stakeholders, we extend our gratitude and sincere thanks for their unwavering support and contributions towards the completion of this report. I also appreciate the community representatives, specifically the Ward Climate Change Planning Committees in all the sixty (60) wards that tirelessly participated in identifying risks, mapping interventions and development of the County Climate Action Plan.

In view of his manifesto, H.E. Hon. FCPA Fernandes Odinga Barasa, OGW is considered the brainchild behind the successful completion of this report. I am therefore highly indebted to him for his excellent leadership, guidance, and support that enabled uninterrupted preparation and completion of the participatory process and finally this report.

I also wish to acknowledge and thank the World Bank and other Development partners for providing both the technical and financial support. The contribution of the Financing Locally Led Climate Action (FLLoCA) Project Implementation Unit for making sure that necessary resources were provided for the capacity building. We do also genuinely appreciate the enormous assistance of those who have not been explicitly mentioned here, but whose contributions were invaluable in enriching and finalizing this report. It is hoped that the strategic partnerships and networks created during the development of this document will be sustained in building knowledge and supporting actions under our sectors mandate.

Ms. Penninah Lung'adzo Mukabane,

County Executive Committee Member,

Department of Water, Environment, Natural Resources & Climate Change.

Executive Summary

Kakamega County conducted a Participatory Climate Risk Assessment (PCRA) and action plan for its 60 wards across twelve (12) sub-counties: Likuyani, Lugari, Malava, Lurambi, Navakholo, Shinyalu, Ikolomani, Butere, Khwisero, Mumias East, Mumias West, and Matungu. The PCRA was undertaken at the ward level. The PCRA is a planning tool used to integrate the consideration of climate and disaster risks of communities into planning and development.

This tool provides the foundation for incorporating climate and disaster risk considerations into community planning and development. It is designed to conduct participatory analyses of risks and their impacts on livelihood resources in both rural and urban settings. The primary goal of this activity was to bolster the participation of vulnerable communities in assessing their climate change and disaster risks, and in developing adaptation strategies for effective climate change planning within the county.

The approach involved the initial identification of pertinent stakeholders for engagement in the PCRA and action planning process. These stakeholders included representatives of women, youth, Persons with Disabilities (PWD), and other marginalized and vulnerable groups. Additionally, a multisectoral workshop was organized to share findings and for community representatives to undertake local level risk assessments and develop action plans.

The Ward Climate Risk Assessment process comprised:

- A sensitization and learning process for assessing risks.
- Risks and resource mapping by the community, which introduced the entire PCRA and climate action planning process, perspectives, and experiences of past and current local weather and climate, as well as adaptation and resilience strategies/priorities.

By the end of the process, the team developed and identified:

- A map of hazards, assets, and resources in the ward.
- Key livelihood resources and assets in the ward.
- Areas and resources at risk from climate, natural, or human-made hazards. Furthermore, each ward developed an action plan aligned with strategies to manage the identified risks.

The priority areas identified culminated in the Kakamega County Climate Change Action Plan, which aligns with both the County Integrated Development Plan 2023-2027 and the National Climate Change Action Plan 2023-2027.

1. Participatory Climate Risk Assessment

1.1. Background

Climate change is viewed as one of the gravest threats to global sustainable development, impacting essential resources vital for supporting human lives and ecological systems (FAO 2015). Fossil fuels, including coal, oil, and gas, are the primary contributors to global climate change,

accounting for over 75% of global greenhouse gas emissions and nearly 90% of all carbon dioxide emissions. As these emissions envelop the Earth, they trap the sun's heat, leading to global warming and subsequent climate change. The planet is now warming at an unprecedented rate in recorded history. Rising temperatures are altering weather patterns and disrupting nature's balance, posing significant risks to all life forms.

Kenya's economy heavily relies on tourism and rain-fed agriculture, both of which are vulnerable to climate change and extreme weather events. Rising temperatures and frequent droughts result in substantial crop and livestock losses, leading to famine, displacement, and other threats to human health and wellbeing.

Kakamega County's economy is predominantly agro-based and hinges on climatic conditions. The region's climate is classified as tropical, largely due to the presence of the Kakamega rainforest, Kenya's sole remaining tropical forest. The county's annual rainfall ranges from 1280.1mm to 2214.1mm, as depicted in Figure 1.1. Rainfall is consistent throughout the year, with March and July experiencing heavy rainfall, while December and February see lighter precipitation.

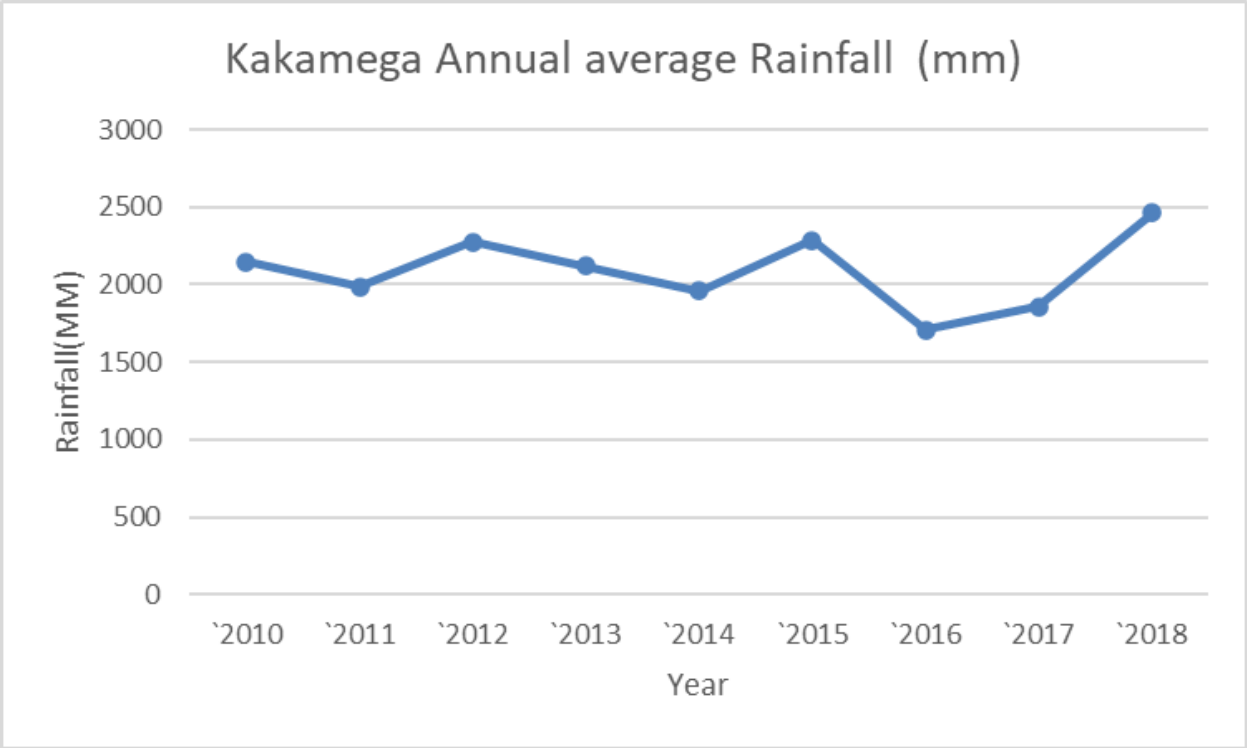


Figure 1.1: Kakamega County Annual Rainfall

In the year 2016, the county received the lowest amount of rainfall whereas in 2018 the highest amount recorded. The temperatures range from 18 degrees Celsius to 29 degrees Celsius with a mean average of 24.5 degrees Celsius. The months of January, February and March are the hottest with the rest of the months having relatively warm temperatures except for July and August which have relatively cold spells. Climate change has resulted in change in temperature levels with projected monthly mean changes of between -0.31°C and 3.8°C for the time period 2011–2040

compared to the period 1981–2010 if actions are not taken to mitigate climate change as illustrated in figure 1.2 below.

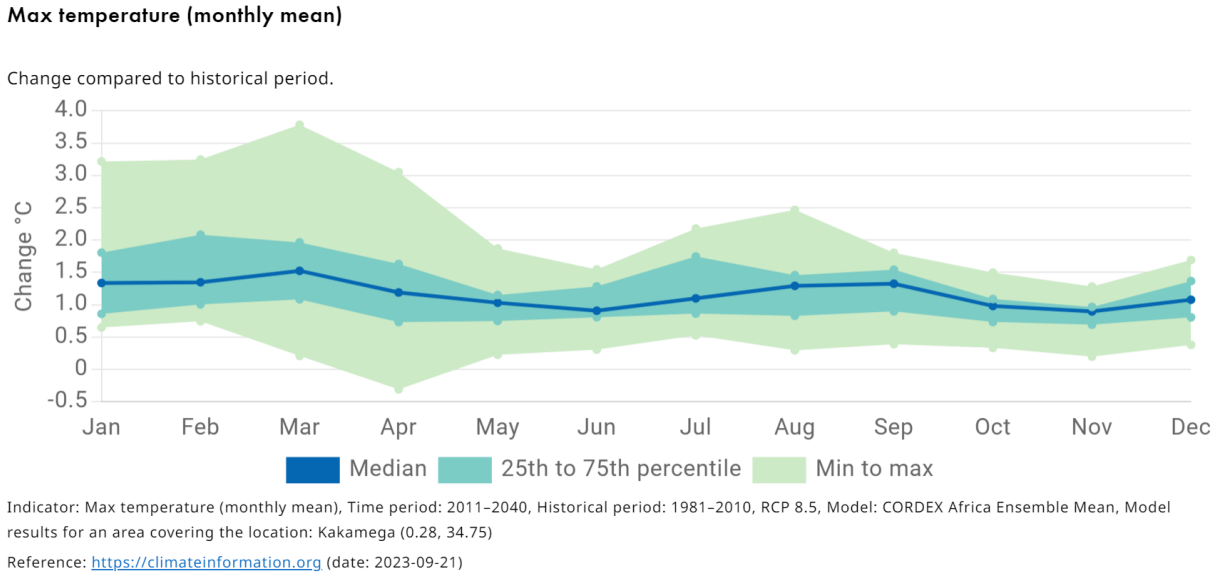


Figure 1.2 Max temperature change compared to historical changes

Future climate change may lead to change in the frequency or severity of such extreme weather conditions, potentially worsening impacts, increased average temperatures and changes in annual and seasonal rainfall will be felt across key economic sectors such as agriculture production, health, water availability, energy use, infrastructure, biodiversity and ecosystem services. Impacts are likely to have disproportionate effects on the poor as they have fewer resources to adapt to climate change.

To mitigate and adapt to effects of climate change, the County Government of Kakamega has developed Climate change governance structures, climate change frameworks, legislation and policy. The County Government has installed two automated weather stations in Matungu and Likuyani sub counties to provide accurate information on real time weather patterns. A Participatory Climate Risk Assessment was carried out within the county in each ward. Members from the community were selected from different groups including elderly, persons with disability, women and youth. This was to establish the historical climatic background, the most vulnerable groups affected by climate change, the resources and assets affected by climate change.

1.2. Climate Change Legislative Framework

This section highlights International, National and County Governance Instruments supporting the Context of the Kakamega County Climate Change Policy

1.2.1. United Nation Framework Convention for Climate Change

The objective of the UNFCCC and other related legal instruments that the Conference of Parties adopt is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

1.2.2. Paris Agreement

The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP 21) in Paris, France, on 12 December 2015. It entered into force on 4th November 2016. The Paris Agreement works on a five-year cycle of increasingly ambitious climate action or ratcheting up carried out by countries. Since 2020, countries have been submitting their national climate action plans, known as nationally determined contributions (NDCs). Each successive NDC is meant to reflect an increasingly higher degree of ambition compared to the previous version.

Kenya has committed to a significant reduction in its greenhouse gas emissions under the Paris Agreement's NDCs. The country pledges to curtail its emissions by 32% by 2030 relative to the business-as-usual scenario of 143 MtCO2eq. This ambitious target encompasses sectors like energy, forestry, waste, industrial processes, and agriculture. On the adaptation front, Kenya emphasises its vulnerability to climate change impacts, prioritizing actions in water, health, agriculture, and fisheries. The nation's goal to achieve a tree cover of at least 10% of its land area underscores the importance of the forestry sector in these commitments. However, the realization of these objectives is contingent upon international support, including finance, technology transfer, and capacity building, with an estimated financial need of around USD 62 billion by 2030. As a county Government, we have been submitting our County Determined contributions to inform the NDCs.

1.2.3. SDGs

The Agenda 2030 on Sustainable Development Goals emphasises the global commitment to address climate change with goal 13 addressing the need to take urgent action to combat climate change and its impacts.

1.2.4. East African Community Regional Climate Change Master Plan 2011-2031

East African Community Regional Climate Change Master Plan 2011-2031 serves as a blueprint to guide regional climate change response measures in the long term. This will help deal with Transboundary climate change issues.

1.2.5. Constitution of Kenya 2010

The Constitution of Kenya 2010 established a devolved system of government and specified the distribution of functions between the national and county governments, as set out in the fourth schedule. As set out in Article 2(6) of the Constitution of Kenya (2010), international treaties and conventions such as the Paris Agreement form part of the law of Kenya.

The County Governments in accordance to Article 185 of the Constitution and County Government Act (2012) are empowered to develop county legislations hence regulate devolved functions provided for in Article 186.

1.2.6. Kenya Vision 2030

This is an economic blueprint that seeks to create "a globally competitive and prosperous nation with a high quality of life by 2030". The Vision is anchored on three key pillars: economic; social; and political. As a climate change adaptation measure, Vision 2030 aspires to conserve water sources and initiate new ways of harvesting and using rainwater, underground water, and increasing acreage under irrigation. The Plan envisages the rehabilitation of hydro-meteorological data gathering networks; construction of multipurpose dams and increasing tree cover by planting at least seven billion trees to address food, water, and energy security. All efforts are incognizant of the fact that the Country is water-scarce amid the increasing water demand.

1.2.7. The Bottom-up Transformation Agenda

Informing the Environment and climate change, the Bottom-up Transformation Agenda is a commitment to reduce emissions by 32 percent by 2030. Key issues include climate change, impact mitigation, adaptation and resilience. The Constitutional mandate to ensure at least 10 percent of the land area is under forest cover calls for ecological sustainable development. The Presidential Manifesto intends to adopt a Bottom up 3P solution (people, planet, profit).

1.2.8. The Climate Change Act, 2016

The objective of the Climate Change Act, 2016 Act is the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.

This Act is applied in all sectors of the economy by the national and county governments to:

a. Mainstream climate change responses into development planning, decision making and implementation;
b. Build resilience and enhance adaptive capacity to the impacts of climate change;
c. Formulate programmes and plans to enhance the resilience and adaptive capacity;

1.2.9. The National Climate Change Policy Framework, 2016

The National Climate Change Policy Framework was developed to facilitate a coordinated, coherent and effective response to the local, national and global challenges and opportunities presented by climate change. An overarching mainstreaming approach has been adopted to ensure the integration of climate change considerations into development planning, budgeting and implementation in all sectors and at all levels of government. This Policy therefore aims to enhance adaptive capacity and build resilience to climate variability and change, while promoting a low carbon development pathway.

1.2.10. County Government Climate change frameworks

The Kakamega County government has developed climate change frameworks including the following:

a) Kakamega County Integrated Development Plan (CIDP 2023-2027)

Elaborate plans have been laid out for the mainstreaming of Climate Change Mitigation and adaptation into development programmes for sustainable development as envisioned in the Governor's manifesto and development agenda. The CIDP will provide access, control and participation in resource management to women, youth, and people with disabilities for purposes of equity and improved livelihoods.

b) The Kakamega Climate Change Act 2020

The Act establishes County climate change framework and structures to mainstream climate change programmes into development planning, decision making and advisory on climate change in the County. Further, the Act creates the Climate Change Fund, financial mechanism and governance framework for climate change response and risk mitigation. To this end, the County has Climate change governance structures put in place consisting of a Steering Committee, County Climate Change Secretariat, a Technical Working Group and Ward Based Climate Change Planning Committees.

c) The Kakamega County Climate Change Policy

The Policy proposes a legislative framework to institutionalize climate change management as well as facilitate flow of climate finances from national and international sources. It prioritizes increasing access to climate change financing opportunities to the lowest levels of governance; establishment of Climate Change Fund to finance locally led integrated climate-compatible development and promote public accountability in utilization of the fund. In recognition of the importance of building and sustaining partnerships with the public and development partners, solid measures have been proposed to consolidate and strengthen the working relations.

d) The Kakamega County Climate Change Adaptation Plan

The adaptation plan seeks to Reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience; integrate adaptation into new and existing County, Sectoral policies and programmes, especially development strategies, plans and budgets.

e) The Kakamega County Climate Information Service Plan

The KCCISP aims to develop and deliver accessible, timely, relevant climate information which can support local, sub-county and county-level decision making processes for the benefit of community livelihoods and key economic sectors in Kakamega County.

1.3. Purpose of the PCRA Report

In order to enhance investment that aims to reduce vulnerability and build resilience of the society, Kakamega County conducted a Participatory Climate Risk Assessment (PCRA) which empowers local communities to analyse climate hazards and suggest their own climate actions. The PCRA was carried out to collect, analyse and systematise information about climate risk and vulnerability in a structured way with the purpose to:

1. Identify the key climate risk vulnerabilities at local/ward levels
2. Understand how community members perceive climatic risks and threats to their lives and livelihoods
3. Analyse the resources (capacities) and strategies available to address or reduce the climatic risks
4. Help wards to develop an action plan

The PCRA data collection process was conducted at ward level through the community area council as per the Kakamega County Decentralised Units (Amendment) Act 2016. The Act provides Community areas as the local community administrative boundaries with Community Area Council as representatives. The council representative consists of women, men, PWDs representing the socio-economic sectors affected by climate change.

1.4. Key Steps in the County's PCRA Process

The County Government of Kakamega, through the Climate Change Unit (CCU) coordinated this process and spearheaded the Participatory County Climate Risk Assessment (PCRA) process. The process was divided into several key steps, each with specific objectives, activities, responsible actors, and duration. This section highlights the process used to undertake the PCRA process.

a) Step 1: Formation of Cross-Sectoral Technical Working Group to Lead Participatory County Climate Risk Assessment Process

The CCU identified and convened a cross-sectoral technical working group (TWG) of qualified individuals with relevant expertise, including representation from key sectors/departments such as: County Disaster Management Unit, Agriculture, Livestock and Cooperatives, Water, Economic

Planning, Social Services, Public Service and Administration, Kenya Meteorological Department, and Kenya School of the Deaf (Sign language Interpreter). The Technical Working Group (TWG) was supported by the technical staff from the Department of Water, Environment, Natural Resources & Climate Change. During its first TWG meeting that was held on 16th May 2023, the TWG developed a plan of activities to guide the PCRA process and set timelines for completion of the identified activities as illustrated in Table 1.1 below:

Table 1.1: PCRA roadmap

COUNTY PARTICIPATORY CLIMATE CHANGE RISK ASSESSMENT AND COUNTY CLIMATE CHANGE ACTION PLAN ROADMAP															
Sno	**ACTIVITIES**	**TIMELINES**													
		March		**April**				**May**				**June**			
	Week	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
1.	Formation of cross sectoral county technical working group to lead PCRA process														
2.	Induction of county technical working group to lead PCRA process														
3.	Stakeholder analysis process														
4.	Stakeholder engagement at ward levels														
5.	secondary data review, tools development and testing														
6.	Data collection in Likuyani subcounty														
7.	Data collection in Lugari subcounty														
8.	Data collection in Malava subcounty														
9.	Data collection in Lurambi subcounty														
10.	Kakamega Municipality														
11.	Data collection in Navakholo subcounty														
12.	Data collection in Shinyalu subcounty														
13.	Data collection in Ikolomani subcounty														

14.	Data collection in Khwisero subcounty														
15.	Data collection in Butere subcounty														
16.	Data collection in Mumias East subcounty														
17.	Data collection in Mumias West subcounty														
18.	Mumias Municipality														
19.	Data collection in Matungu subcounty														
20.	Data analysis and draft report														
21.	County level Multi Disciplinary Climate Risk Assessment Workshop														
22.	Climate Risk Assessment report														
23.	Review of key documents														
24.	Collecting public input														
25.	Drafting the County Climate Change Action Plan (CCCAP)														
26.	Validation workshop														
27.	Public feedback on draft CCCAP														
28.	Development of second draft CCCAP														
29.	Presentation to cabinet for approval														
30.	Presentation to the county Assembly for adoption														
31.	Launch of CCAP														

This roadmap enabled delivery of the PCRA exercise in good time.

b) Step 2: Stakeholder Analysis and Engagement Process

The technical Working Group was instrumental in identifying all key stakeholders at county, sub-county, and ward levels, through a robust consultative process, who participated and contributed

to the PCRA process. The identified stakeholders included representatives of groups traditionally marginalised and vulnerable to the impacts of climate change, such as women, Youth, Persons with Disability (PWDs), and the elderly. The group undertook the stakeholder analysis by identifying stakeholders that: i) were formally responsible for climate action and building resilience; ii) were involved in climate action and responses to climate impacts; iii) had knowledge and expertise relevant to climate action and building resilience, including knowledge on the climate system and climate risks; iv) were impacted by climate change. Once the key stakeholders that needed to be engaged were identified, the TWG developed a strategy/process to engage with these stakeholders throughout the whole process.

c) Step 3: Stakeholder Engagement at all Levels

The objective of this step was to ensure that all key stakeholders identified in step 2, including communities and other key local actors, were fully engaged and contributed to the PCRA process.

With the list of key stakeholders at county, sub-county, and ward levels and a strategy/process to engage with each of them in Step 2, the technical WG approached, mobilized, sensitized, and consulted these stakeholders on the PCRA process. This process was done while considering gender balance and representation of marginalized and vulnerable groups. This engagement process incorporated the tenets of public participation as a meaningful process of empowerment of local people, by placing them at the centre of decision making. County stakeholders were identified by line Departments through a consultative process with the CCU and the TWG. These Departments were better suited at identifying these stakeholders since they already work with them.

At the sub-county and ward levels, this step also involved obtaining communities' views of local climate risks, vulnerabilities, and priorities for climate action investments. The exercise involved consultative meetings with the identified stakeholders in all the sixty (60) wards of the County. Due to logistical challenges and the geographical vastness of the County, some wards were clustered together but each ward identified its own unique issues. Furthermore, the Ward Climate Change Planning Committees (WCCPCs) were instrumental in facilitating ward-level engagements.

d) Step 4: Data Collection and Workshop Preparation

In this step, the TWG prepared for the workshop. This involved a series of activities including the appointment of a workshop facilitation team, identification of 'table groups' for the workshop group sessions, and preparation of workshop materials. To cover the entire County, the team was split into three groups namely Team 1: Northern Region- Likuyani, Lugari and Malava Sub counties; Team 2: Central Region: Ikolomani, Shinyalu, Lurambi and Navakholo Sub counties and Team 3: Southern Region: Mumias East, Mumias West, Matungu, Khwisero, Butere Sub counties.

The TWG reviewed all relevant national development, climate, and sectoral plans, including the National Climate Change Action Plan 2018-2022 and the Kenya Climate Smart Agriculture Strategy 2017-2026. Key county development and sectoral plans, such as the Kakamega County Integrated Development Plan (CIDP) 2022-2027; Kakamega County Sector Plan, the Kakamega

County Disaster Report were also reviewed. The target was to align the climate resilience investment priorities with other county plans and policies and with the national climate priorities.

In addition, the technical WG was furnished with data, information and reports by selected stakeholders during the consultation process in step 3, including County weather and climate information from the Kenya Meteorological Department (KMD), among others. Further, the input from community fora and Ward Climate Change Planning Committee (WCCPC) meetings was included during the review. This step ensured that the technical WG integrated the information, reports, and data provided following the consultation process in step 3 effectively.

During the PCRA data collection exercise, the teams worked simultaneously as follows:

1. Friday 19th May 2023: Wards in Malava, Shinyalu, Mumias East and Mumias West Sub counties
2. Monday 22nd May 2023: Wards in Lugari, Navakholo and Butere Sub counties
3. Tuesday 23rd May 2023: Wards in Likuyani, Matungu and Lurambi Sub counties
4. Wednesday 23th May 2023: Wards in Ikolomani and Khwisero Sub counties.

The consultative process was inclusive where a total of 443 community members were actively involved in identification of climate hazards and risks as well as developing community climate actions as coping strategies against the identified risks. From the total participants, 164 were women and 279 were men. The vulnerable community representation was as follows; 13.5% persons with Disability (PWDs); 28.4% Youth and 8.3% elderly.

e) Step 5: Multi-Stakeholder Climate Risk Assessment Workshop

This step was designed to conduct a participatory and cross-sectoral holistic assessment of current and likely future climate risks facing the Kakamega County, exploring exposure, vulnerability, and adaptive capacity. It also aimed to identify robust, broad thematic adaptation investment areas that can address the current and future climate vulnerabilities of different groups.

Stakeholders mapping and Analysis was conducted by the TWG from 15th -19th of May, 2023. The detailed stakeholder list is in the appendix. The stakeholder working within Kakamega County were further analysed in terms of level of vulnerability and level of influence as categorised in Figure 1.1 below:

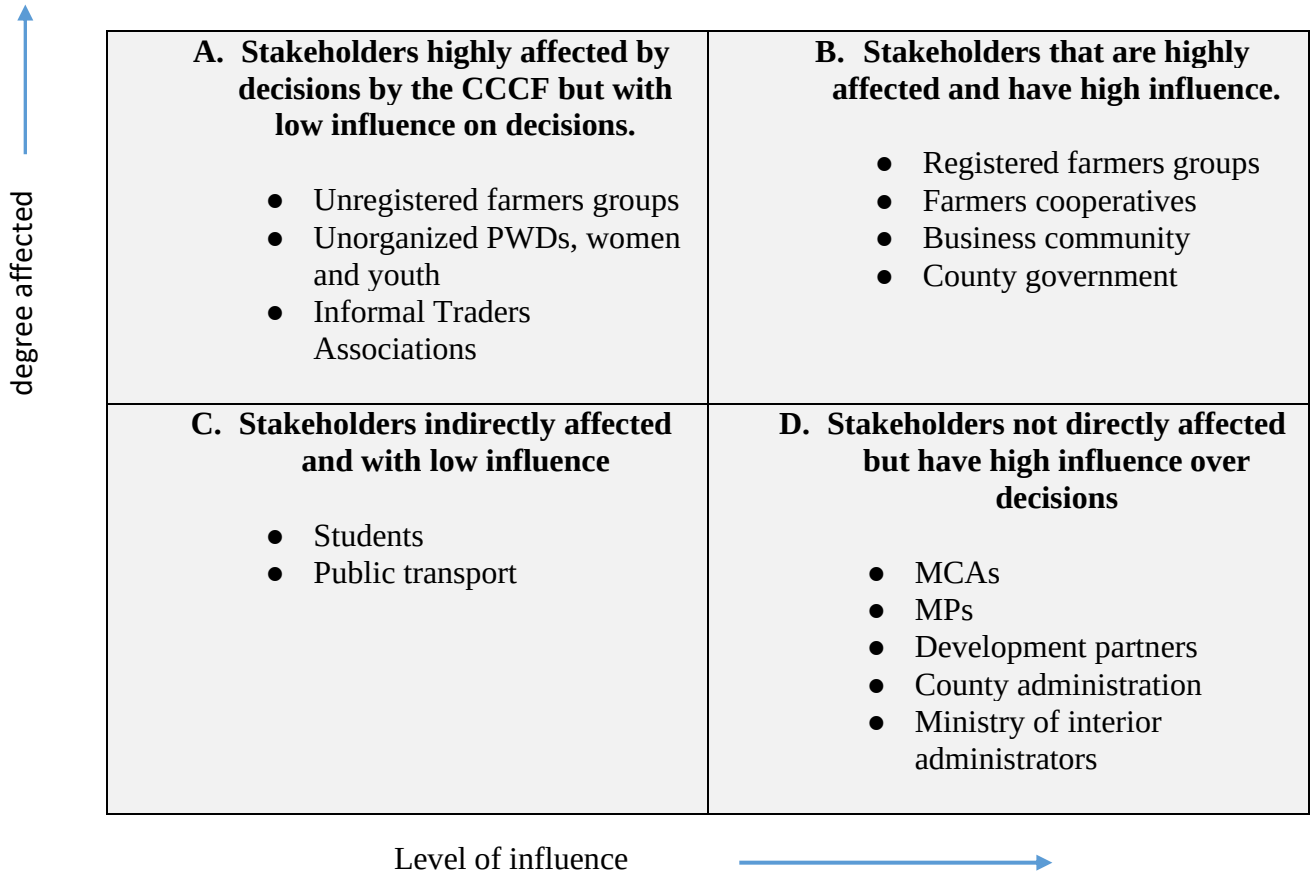


Figure 1.3: Vulnerability of stakeholders to climatic hazards

Due to the vastness of Kakamega County, the workshop was done in three regions Team 1: Northern Region- Likuyani, Lugari and Malava Sub counties; Team 2: Central Region: Ikolomani, Shinyalu, Lurambi and Navakholo Sub counties and Team 3: Southern Region: Mumias East, Mumias West, Matungu, Khwisero, Butere Sub counties. Each team comprised of a technical expert (team leader) and other facilitators with vast experience and knowledge on climate change adaptation and mitigation.

The workshops were organized into both plenary and breakout (group) sessions that were participatory and interactive. The group sessions were designed to yield specific information on the priority actions per sector in line with the National Climate Change Action Plan (NCCAP), including Disaster Risk (Floods and Drought) Management; Food and Nutrition Security; Water and the Blue Economy; Forestry, Wildlife and Tourism; Health, Sanitation and Human Settlements; Manufacturing; Energy and Transport.

Information and data from the workshops aided the CCU and the WG to develop a draft climate risk profile of Kakamega County with identified current climate hazards and trends. The risk

profile also included the identified future climate context and adaptation. Finally, the workshop output led to the development of integrated strategic resilience priorities and objectives for the Kakamega County.

f) Step 6: Climate Risk Assessment Report

After the conclusion of the multi-stakeholder climate risk assessment workshops, the technical working group (WG) identified a small team, including the team leaders and members of the CCU to compile, analyse and summarise the information collected during the entire PCRA process and prepare a draft Kakamega County Climate Risk Assessment report. The draft report included identified hazards, current and future climate risk exposure and vulnerability, County risk profile, projected future trends, coping/adaptation strategies and wider strategic integrated, cross-sectoral adaptation planning priorities for Kakamega County for the next five-year time frame and ten-year period. The report adopted a standard format from the PCRA Guidelines but was tailored in some sections to suit Kakamega County context.

The Climate Change Unit and the WG convened another workshop to share the draft PCRA report with stakeholders for review to ensure that it integrated all key inputs and perspectives from the different interest groups. Following this review, the report was finalised and validated by the technical WG and wider consultative group.

g) Step 7: Preparation of County Climate Action Plan

The PCRA process informed the development of the Kakamega County Climate Action Plan (KCCAP). This plan has been aligned with the National Climate change action plan for ease of reporting on County Determined Contributions (CDC).

2. COUNTY CLIMATE HAZARD PROFILE

2.1. Background

Kakamega County experiences the following climatic hazards; Floods, Lightning, Mudslides, Prolonged Dry Spells (PDS), Environmental Degradation and Invasive Alien Species (IAS). These climatic hazards cause havoc in life, property, livelihood and environmental resources as well as in physical infrastructure with varied consequences, some quite devastating. Lightning, floods, Mudslides, IAS and PDS are the most common disasters impacting the County adversely. Socio-economic activities are at such times rendered dysfunctional, particularly for the communities directly hit. The combination of these multiple hazard events poses serious threats to the County's efforts to invest in development, hence the urgent need for contingency planning.

2.2. Current and Historical Climate Hazards and Trends in Kakamega County

Trends in occurrence of climatic hazards have varied during the years. Historically, some climatic hazards such as floods and Prolonged Dry Spells (PDS) occurred rarely as compared to the current situation whereby floods are experienced frequently in the County.

2.3. Exposure and Vulnerability Profiles of Kakamega County

Most communities in Kakamega County are vulnerable and exposed to climatic hazards. The vulnerable groups that are mostly exposed to the harsh impacts of climatic hazards include, children, PWDs, elderly and women. Many communities living along the rivers are most exposed to the impacts of flooding. Farmers also experience the harsh impacts of climatic hazards since their sources of livelihoods are affected when these hazards occur.

Table 2.1: Exposure and vulnerability profile

Sector	Exposure and vulnerability profile
Agriculture	Farmlands along the rivers and streams are the most affected where crops on their land are swept away during heavy rains and encounter post-harvest losses in case farm lands are flooded prior to harvesting of mature crops. During the prolonged dry spell, farmers who are dependent on rain fed agriculture are highly impacted due to crop and animal fodder failure. This is most common in Sub Counties that receive minimum rainfall i.e. Likuyani, Lugari and Khwisero. This leads to low agricultural land productivity and increased cases of invasive pests, weeds and diseases compromising quality of agricultural products. Women are highly impacted because they are the ones to provide food for their families while elderly and children are more likely to suffer from malnutrition.

Water	The main water sources within the County are rivers, springs, boreholes and shallow wells. Some of the rivers traversing the county include; Nzoia, Yala, Lusumu, Isiukhu, Shiatsala, Firatsi, Kipkaren and Sivilie. Climate change impacts the said water resources directly resulting in reduction of quantities, drying of the sources especially wells and springs. Communities are forced to travel longer distances to fetch water from permanent sources. Households that rely on seasonal surface water sources and shallow wells are the most affected. In most families, it is the role of women and children to provide water for domestic use and is therefore the most vulnerable. During heavy rains, flooding leads to contamination of water sources especially water from shallow wells mixing with sewerage leading to increased cases of water borne diseases which impacts children more. The most affected are households that don't access piped water
Forestry and Environment	There are six gazetted forests within the County namely; Kakamega, Malava, Bunyala, Lugari, Misango hills and Kisere Forest Reserve with a total of 33,183.6 hectares. Communities residing along the edges of the forest gather firewood, charcoal, medicinal plants, animal fodder, honey for commercial and domestic consumption and timber for construction of houses. On the contrary, the forests have been degraded due to prolonged dry spell and emergence of invasive species such as Guavas (Psidium guajava) and Lantana camara. These effects have adversely impacted our forest ecosystem with evident scenarios of bird migration to other areas. The poorest community members who rely on forests for livelihoods e.g. Firewood, fodder/pasture, herbal medicine and thatching grass are the most affected when such materials are no longer available from the forest. Women and children are the most affected since they are the ones who exclusively source for firewood, and fodder/pasture during the seasons that they are scarce.
Transport and infrastructure	Excessive rains on several occasions cause temporary or permanent flooding of roads and bridges. It is common in areas along Rivers (Nzoia, Yalu, Isiukhu, Lusumu, Kipkaren and Shatsala) and dams (Siyenga & Kilimani). The resultant impact is destruction of infrastructure to the extent of disrupting communities from accessing essential services such as marketplaces for traders and buyers, schools for school going kids and health facilities for people seeking for medical services.
Energy	Fuel wood is the principal source of rural energy within the county. Approximately 80.8% and 8.2% of the population depend on firewood and charcoal respectively. During the excessive rainfall season, women in most households are forced to use wet firewood which leads to indoor pollution. On the contrary, prolonged dry spell the forest ecosystem regenerative capacity is diminished leading to restriction of harvesting forest products as a result wood biomass scarcity is experienced affecting women and children.

2.4. Spatial Distribution of Climatic Hazards in Kakamega County

Climatic hazards are distributed across the 12-sub counties in Kakamega County.

Table 2.2 below shows the trends in climatic hazards, their spatial distribution and the vulnerable groups affected by the climatic hazards in Kakamega County.

Table 2.2: Historical and current trends of climatic hazards, their spatial distribution and the vulnerable groups affected by the climatic hazards in Kakamega County

S/NO	CLIMATIC HAZARDS	HISTORICAL TRENDS	CURRENT TRENDS	SPATIAL DISTRIBUTION OF HAZARDS	VULNERABLE GROUPS AFFECTED BY HAZARDS
1	Lightning strikes	-Lightning episodes of about 240 days a year occur in the County. -This is due to its location. Kakamega County is wedged on an escarpment between the moist, warm winds of Lake Victoria on the west and the cool, high-altitude winds prevailing all year-round from the East. (Note: thunder and lightning may still occur even when there is no rain).	Frequent occurrence of lightning strikes.	-Navakholo, Lugari, Likuyani and Shinyalu sub-counties are mostly affected by lightning strikes.	School going children, PWDs, Elderly, Livestock farmers, Women
2	Floods	-This was common during both the long rains season (March – June) and short rains seasons (October – December)	-Flooding currently occurs between April – June) Frequent hailstones	-1997/1998 El Niño -Kuvasali (Malava sub county) -Along Rivers; Nzoia (Chevaywa in Lugari, lower Matungu and Mumias West,	Farmers, Elderly, Children, business community, WASH systems

S/NO	CLIMATIC HAZARDS	HISTORICAL TRENDS	CURRENT TRENDS	SPATIAL DISTRIBUTION OF HAZARDS	VULNERABLE GROUPS AFFECTED BY HAZARDS
			experienced during heavy rains	Lusumu (Mumias East, Kholera in Matungu, Yala in Khwisero and Ikolomani, Isiukhu in Shinyalu and - In the flood plains of Namamali in Matungu sub - county -Major urban towns e.g Kakamega and Mumias Municipalities.	
3	Mudslides	Occurred in small scale, affecting relatively small group of people living closer to the hills	Frequent occurrence of mudslides and in large affecting a large group of people.	-Kakamega/Nandi Border (April 2006) -Khuvasali (August 2008) -Lirhembe (Ikolomani) -Ileho (Shinyalu) -Along River Yala (Ikolomani and Khwisero).	Households living within the proximity of the hill, Farmers, Children,
4	Environmental degradation	Occurred in small scale across the year in various forms	Occurs in large scale across the year affecting large communities in the county	-All sub-counties are affected by land degradation in the form of deforestation, soil erosion, overgrazing, and wetland draining. -Land degradation is also caused by mining, especially in Rosterman in Lurambi Sub-County; Bushiangala and Sigalagala in Ikolomani Sub-County.	Women, farmers,

S/NO	CLIMATIC HAZARDS	HISTORICAL TRENDS	CURRENT TRENDS	SPATIAL DISTRIBUTION OF HAZARDS	VULNERABLE GROUPS AFFECTED BY HAZARDS
5	Prolonged Dry Spell (PDS)	Short seasons on dry spells	Increased frequency in dry spell occurrences.	All sub – counties are affected by prolonged dry spells during the dry season.	Farmers, women, children, Elderly, PWDs.
6	Invasive Alien Species (IAS)	No cases of alien species in the past	Frequent cases of alien species across the year e.g. cascuta dodder, fall army worms, quavas	All sub-counties are affected by invasive alien species.	Farmers, children, PWDs, Elderly
7	Hailstones	Occasional occurrence of hailstones in the past	Frequent occurrences especially during the rainy season	All sub-counties are affected by hailstones during rainy season	Farmers, business community

2.5. Differentiated impacts of Climate Hazards in Kakamega County

Climatic hazards cause severe impacts to the community. These impacts cut across social, economic and environmental impacts to the communities in Kakamega County. Table 2.2 below show the differentiated impacts of climatic hazards in Kakamega County.

Table 2.3: Differentiated impacts of climatic hazards in Kakamega County

S/NO	CLIMATE HAZARD	Risk	SECTOR	SOCIAL IMPACTS	ECONOMIC IMPACTS	ENVIRONMENTAL IMPACTS
1.	Excessive rainfall	Floods	Agriculture, Livestock & Fisheries	-Loss of lives and livestock -increased cases of human and livestock diseases -Displacement of farming communities -Destruction and contamination of fish ponds & cages	-Loss of income -Reduced agricultural productivity -Destruction of agricultural products storage facilities -Increased food prices -Damage of resources -Permanent loss of shelter/houses - Destruction of livelihoods of the communities due to submersion of acres of land	-Land degradation -Soil erosion -Contamination of water sources for humans and livestock -Loss of biodiversity

S/NO	CLIMATE HAZARD	Risk	SECTOR	SOCIAL IMPACTS	ECONOMIC IMPACTS	ENVIRONMENTAL IMPACTS
			Water	-Contamination of water bodies -increased water borne diseases -Displacement of communities living in flood prone areas to safer grounds raising burden on existing water utilities in areas where they relocate to. -reduced access to safe water as a result of damaged water supply infrastructure -Increased health risk to vulnerable groups due to limited access to clean water and sanitation facilities	-High cost of repairing and replacing damaged water supply and sanitation infrastructure -Loses for water service providers due to interruption in water supply -Reduced productivity for water service providers	-Degradation of water quality -Habitat disruption -Reduced capacity of water harvesting & storage reservoirs due to sedimentation -Destruction of river banks & loss of riparian vegetation
			Forestry & Environment	-Displacement and livelihood disruption -Increased pressure on forest products such as; fuel, food & fodder for livelihood	-wood & non wood forest product loss - Increased cost of forest restoration -supply disruptions and increased cost of wood biomass	-Forest land erosion and degradation -Habitat disruption -Spread of invasive plant species such as quavas

S/NO	CLIMATE HAZARD	Risk	SECTOR	SOCIAL IMPACTS	ECONOMIC IMPACTS	ENVIRONMENTAL IMPACTS
			Transport & Infrastructure	-Disruption of transportation networks limiting access to essential services and markets -increased pressure to health care facilities due to increased cases of waterborne diseases -interruption of education due to difficulties in accessing the schools. -Drowning	- High cost of repairing the damaged infrastructure -Economic losses due to increased transport costs & supply chain disruption -Loss of income due to disrupted services	-Destruction of foundation of infrastructure e.g. bridges & dams due to soil erosion -Habitat disruption
			Energy	-power outages -communication disruptions -disruption of health care services due to reliance on uninterrupted power supply.	-Costly repairs and replacement of damaged energy infrastructure. - Loss of productivity for businesses that are reliant on stable power supply	-Environment pollution from the damaged energy infrastructures
2.	Prolonged Dry spell	Crop failure	Agriculture	-Reduced crop yield that can result in malnutrition especially among children, PWDs & elderly.	-loss of income from loss or reduced yield. -Increased food prices - High cost of inputs	-Soil degradation & reduced soil fertility.
		shortage of forage & livestock diseases	Livestock & Fisheries	-Loss of livestock affecting farmers' livelihoods. -Destruction of fish ponds	-loss of livelihoods due to death of livestock -increased cost of animal treatment - Increased cost of animal feeds	Soil degradation & reduced soil fertility. -Depletion of water sources affecting aquatic ecosystems and fisheries

S/NO	CLIMATE HAZARD	Risk	SECTOR	SOCIAL IMPACTS	ECONOMIC IMPACTS	ENVIRONMENTAL IMPACTS
		Drying of water sources	Water	-Contamination of water sources -Water scarcity affecting community access - increased water borne diseases -destruction of water infrastructure -Siltation in water bodies	-High cost of water accessing water services -high cost of treating water borne diseases -reduced income to water revenue providers	-Land degradation and erosion -Loss of biodiversity -Groundwater depletion -Reduced water flows on rivers and streams
		Soil degradation	Environment & Forestry	-land degradation - Increased conflicts related to resource scarcity	-Reduced ecosystem services -Wood and non-wood product losses	-Habitat degradation affecting wildlife populations and biodiversity -Reduced vegetation cover
		Reduced energy production	Energy	-Power rationing -Energy scarcity	-Increased energy production cost & energy prices -Business disruption and increased operational cost	-Increase emission and air pollution due to reliance on fossil fuel
3.	Invasive Alien Species (IAS)		Agriculture & Livestock	-Reduced agricultural yield -Spread of diseases & parasites	-Livelihood disruption - crop and livestock losses -increased cost of pest and disease control -Reduced fishery yield and income	- Habitat disruption
			Environment & Forestry	-Spread of diseases and parasites on forest ecosystem -Food and herbal medicine shortage	-Wood and non-wood forest products loss	-Loss of biodiversity -Habitat disruption -disruption of environmental services -soil erosion

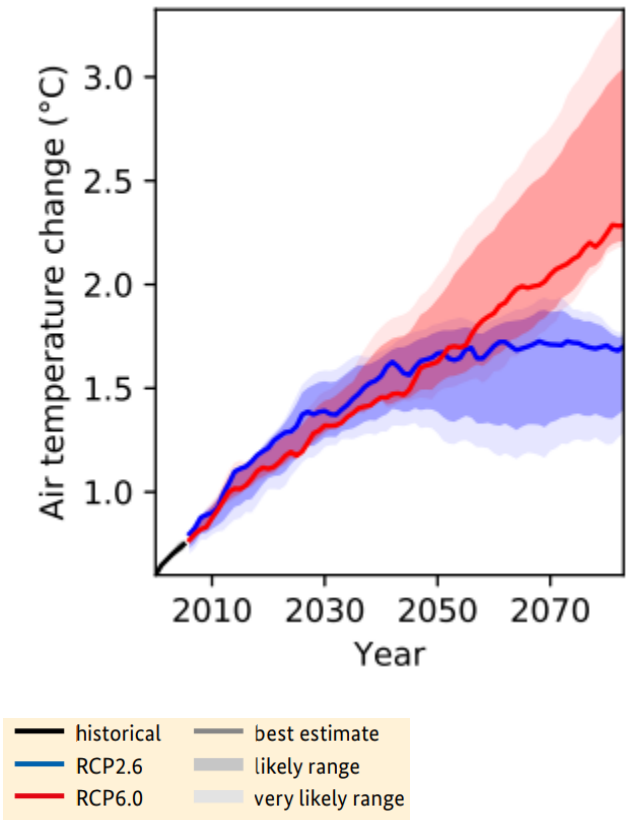
3. FUTURE CLIMATE SCENARIOS FOR THE COUNTY

3.1. National and downscaled climate change projections

Continued emissions of greenhouse gases will lead to further climate changes. Future changes are expected to include a warmer atmosphere, a warmer and more acidic ocean, higher sea levels, and larger changes in precipitation patterns. The projections for temperatures and rainfall have been done using global models .

3.1.1. Temperature

Depending on the scenario, temperature in Kenya is projected to rise by between 1.2 and 3.2 °C by 2080, compared to pre-industrial levels, with higher temperatures and more temperature extremes projected for the north and east of Kenya. Compared to pre-industrial levels, median climate model temperature increases over Kenya amount to approximately 1.4 °C in 2030 and 1.7 °C in both 2050 and 2080 under the low emissions scenario RCP2.6. Under the medium/high emissions scenario RCP6.0, median climate model temperature increases amount to 1.3 °C in 2030, 1.6 °C in 2050 and 2.2 °C in 2080 Figure 1 below



Lines and shaded areas show multi-model percentiles of 31-year running mean values under RCP2.6 (blue) and RCP6.0 (red). In particular, lines represent the best estimate (multi-model median) and shaded areas the likely range (central 66 %) and the very likely range (central 90 %) of all model projections.

Figure 3.1: Air Temperature projections for Kenya for Different GHG emissions

3.1.2. Very hot days

In line with rising mean annual temperatures, the annual number of very hot days (days with daily maximum temperature above 35 °C) is projected to rise substantially and with high certainty, in particular over central and eastern Kenya. Under the medium/high emissions scenario RCP6.0, the multi-model median, averaged over the whole country, projects 25 more very hot days per year in 2030 than in 2000, 36 more in 2050 and 59 more in 2080. In some parts, especially in northern and eastern Kenya, this amounts to about 300 days per year by 2080 (Figure 2).

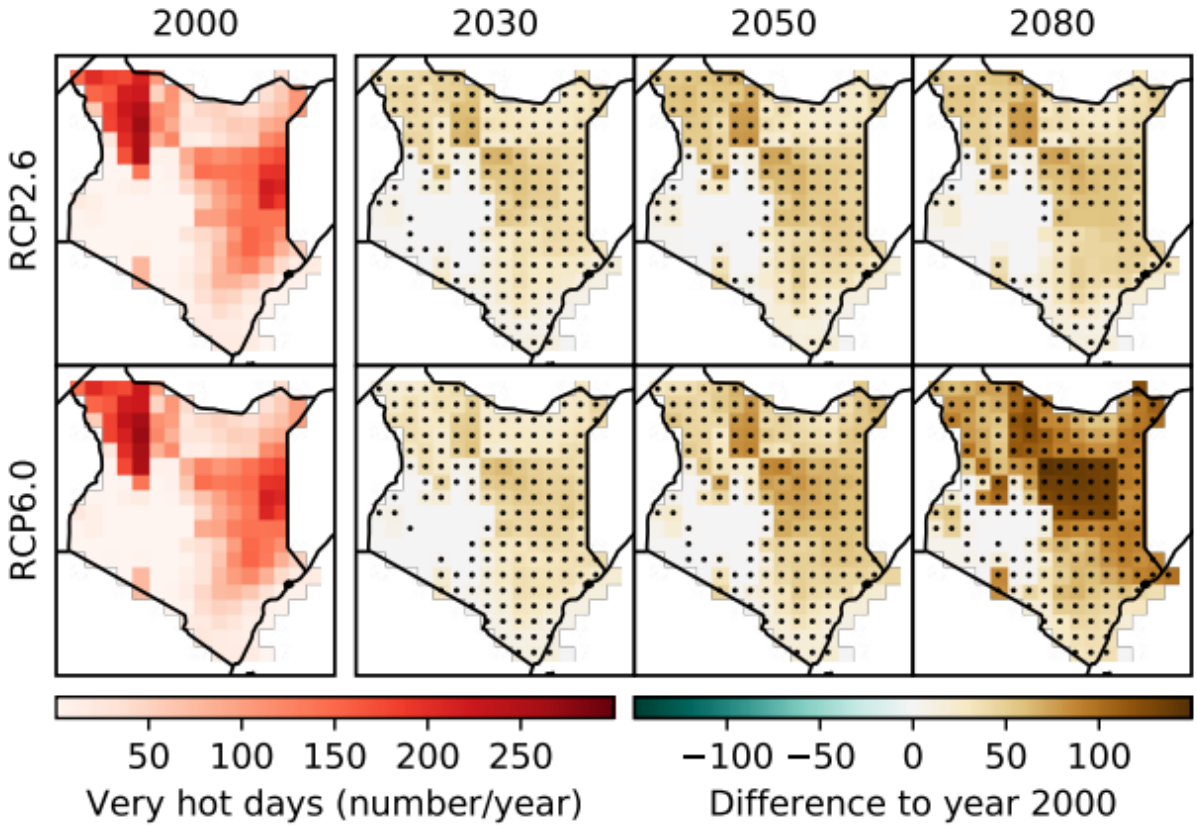


Figure 3.2: Projections of the annual number of very hot days (daily maximum temperature above 35 °C) for Kenya for different GHG emissions scenarios

3.1.3. Precipitation

Future projections of precipitation are less certain than projections of temperature change due to high natural year-to-year variability. Out of the three climate models underlying this analysis, one model projects no change to a slight decrease in mean annual precipitation over Kenya under RCP6.0, while the other two models project an increase under the same scenario. Under RCP2.6, median model projections indicate a slight increase towards the year 2030 but an overall decrease towards the end of the century. Under RCP6.0, the projected precipitation increase is likely to

intensify after 2050, reaching 53 mm per year at the end of the century compared to 2000. Higher concentration pathways suggest an overall wetter future for Kenya (Figure 4.3).

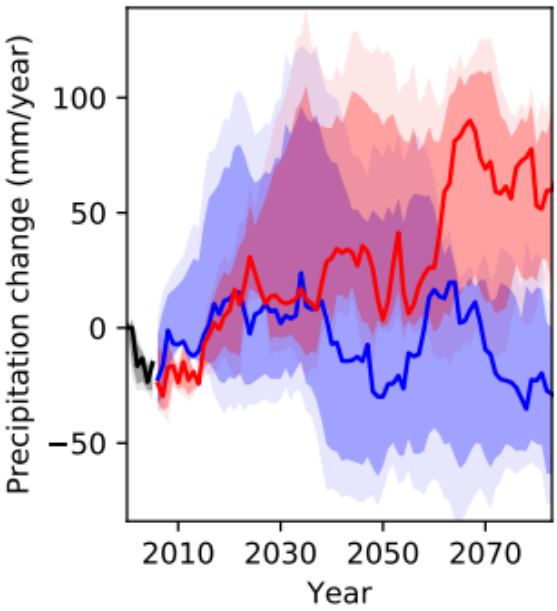


Figure 3.3: Annual mean precipitation projections for Kenya for different GHG emissions scenarios, relative to the year 2000.

3.1.4. Heavy precipitation events

In response to global warming, heavy precipitation events are expected to become more intense in many parts of the world due to the increased water vapour holding capacity of a warmer atmosphere. At the same time, the number of days with heavy precipitation events is expected to increase. This tendency is also found in climate projections for Kenya (Figure 4), with climate models projecting an increase in the number of days with heavy precipitation, from 7 days per year in 2000 to 9 days per year in 2080 under RCP6.0. Under RCP2.6, the number of days with heavy precipitation remains unchanged.

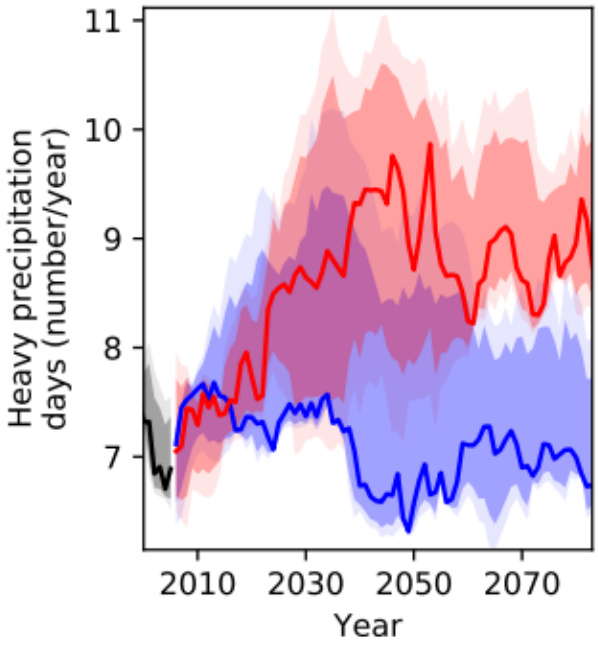


Figure 3.4. Projections of the number of days with heavy precipitation over Kenya for different GHG emissions scenarios, relative to the year 2000.

3.2. County future climate scenarios

In view of global warming, Kakamega county is likely to be affected in increased atmospheric temperature and precipitation hence impacted in various socio-economic activities.

3.2.1. Precipitation

The model projects an increase in precipitation in October-December season and a decrease in March-May season over Kakamega (Figure 4.5). Due to high natural year-to-year variability, future projections of precipitation are less certain than projections of temperature change. Annual rainy seasons in Kenya are becoming progressively wetter, with sudden and/or late onsets bringing with them floods and inundation. Excessive flooding in Kenya occurs relatively frequently (on average every three to four years) and is linked to El Niño or La Niña episodes that can lead to extreme weather in the country and region. Dry conditions cause severe crop and livestock losses, famine and population displacement. The March to May rainfall seasonal popularly known as the long rainfall seasonal is projected to have decrease in rainfall (Figure 4.5) implying that the county is likely to have depressed rainfall. Thus dry spells within a season are likely leading to food insecurity. Climate change introduces an additional uncertainty into existing vulnerabilities. During flood events there is often an upsurge in waterborne or sanitation-related diseases, such as typhoid, cholera, malaria and diarrhoeal diseases. Critical infrastructure that supports the national economy, such as roads, bridges, water pipelines and power lines are prone to flood damage. The 1997/98 El Niño floods seriously damaged water supply infrastructure and transport networks

across the country, with dams, water pans and some pipelines in 22 counties either destroyed or severely damaged.

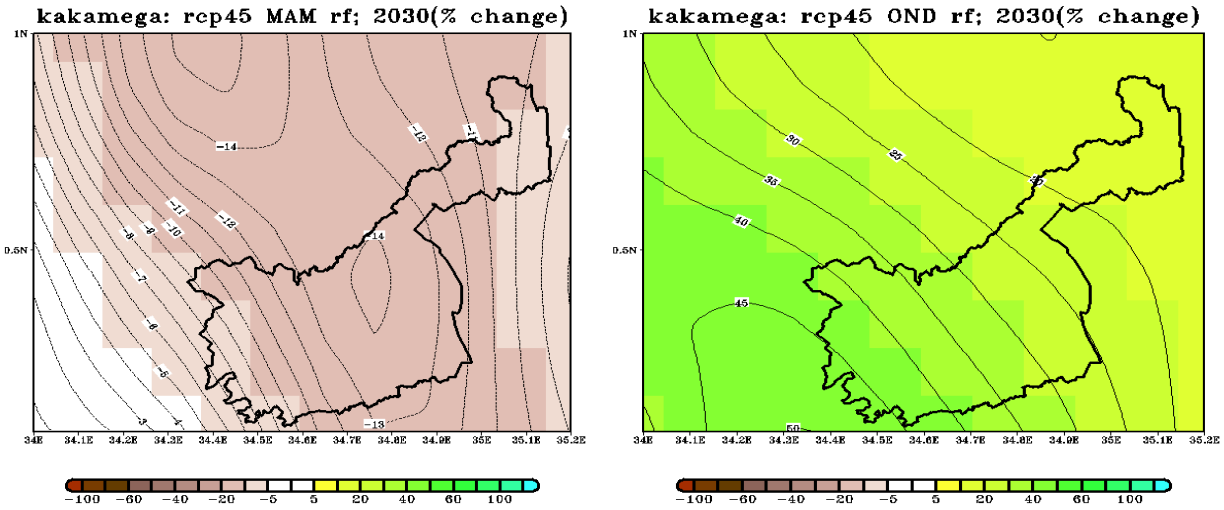


Figure 3.5: Projected Seasonal Rainfall Change for Kakamega County Using CORDEX (By 2030)

3.2.2. Temperature

The maximum and minimum temperatures are projected to increase by 2030 with increase in global emissions (Figure 4.6). Increased temperatures in the future are likely to exacerbate the drought conditions and may have a significant impact on water availability and general well-being.

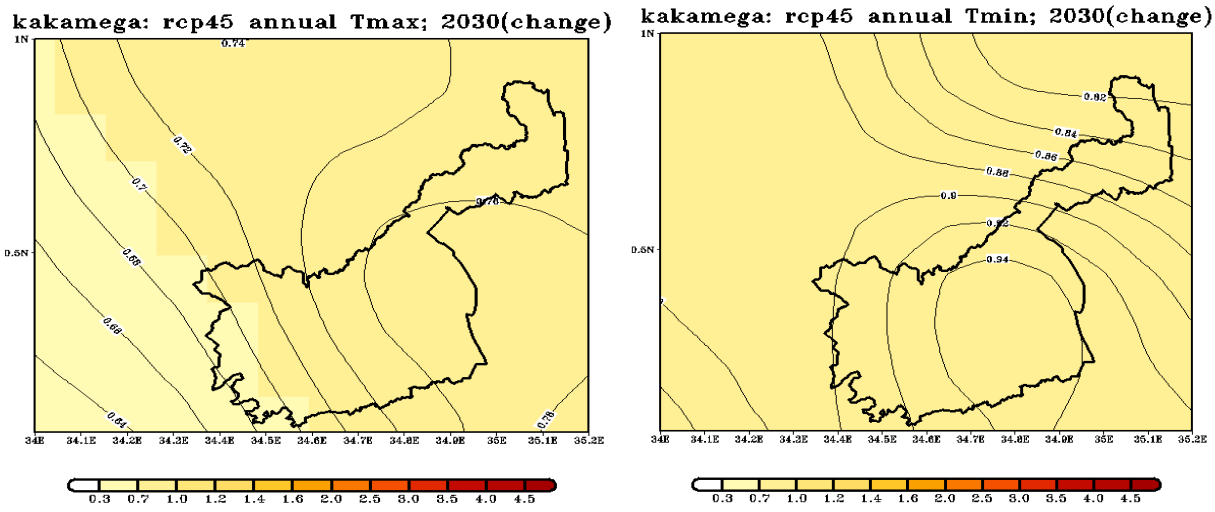


Figure 3.6. Projected Temperature Change for Kakamega County Using CORDEX (By 2030)

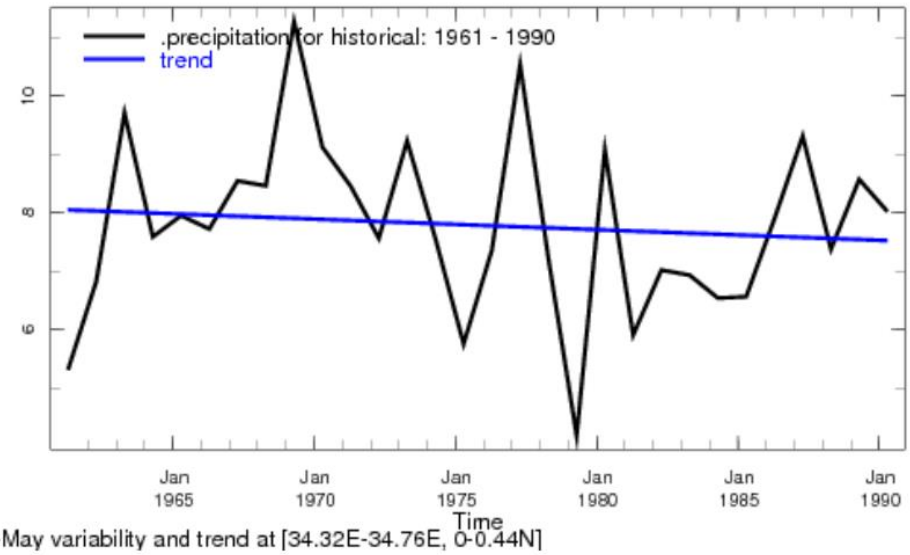
Rising global temperatures increase the moisture the atmosphere can hold, resulting in more storms and heavy rains, but paradoxically also more intense dry spells as more water evaporates from the land and global weather patterns change.

Drought and flood risks, and associated societal damages, are projected to further increase with every degree of global warming (IPCC).

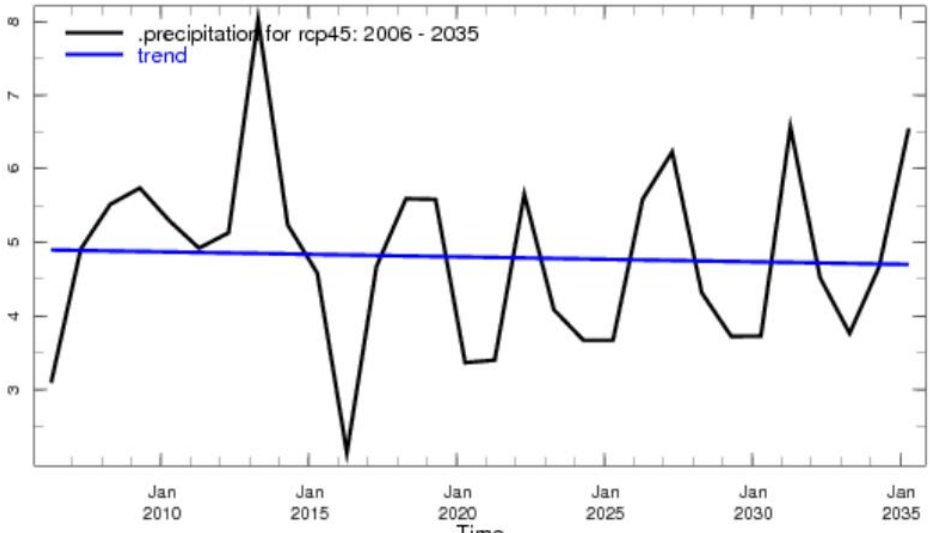
Early warning systems for floods, droughts and other water-related hazards provide a more than tenfold return on investment and can significantly reduce disaster risk: a 24-hour warning of a coming storm can cut the ensuing damage by 30 per cent (WMO).

3.2.3. Seasonal changes

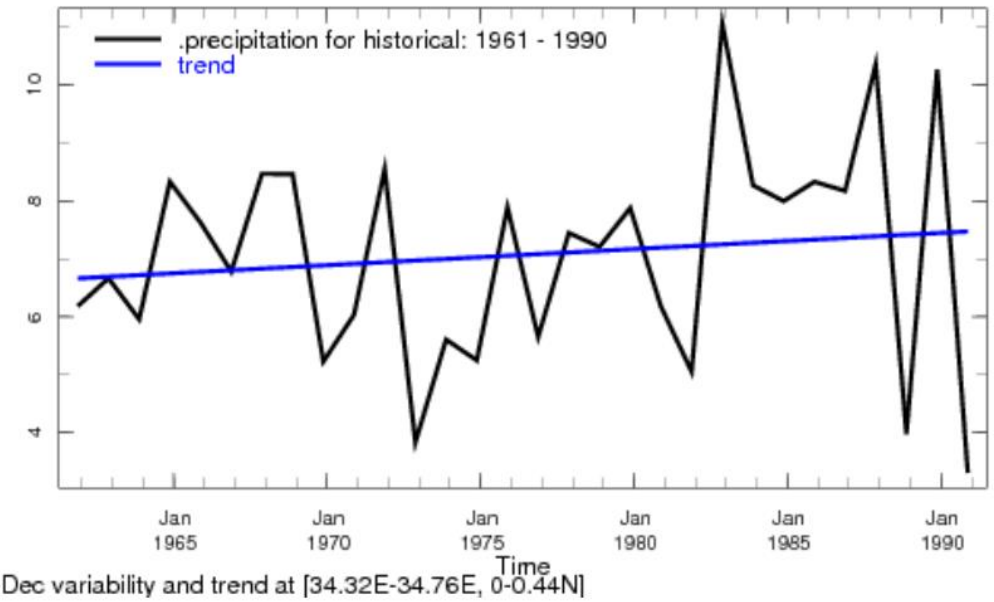
Future changes in seasonal climate with reference to a historical climatological period 1961-1990, 1981-2010.



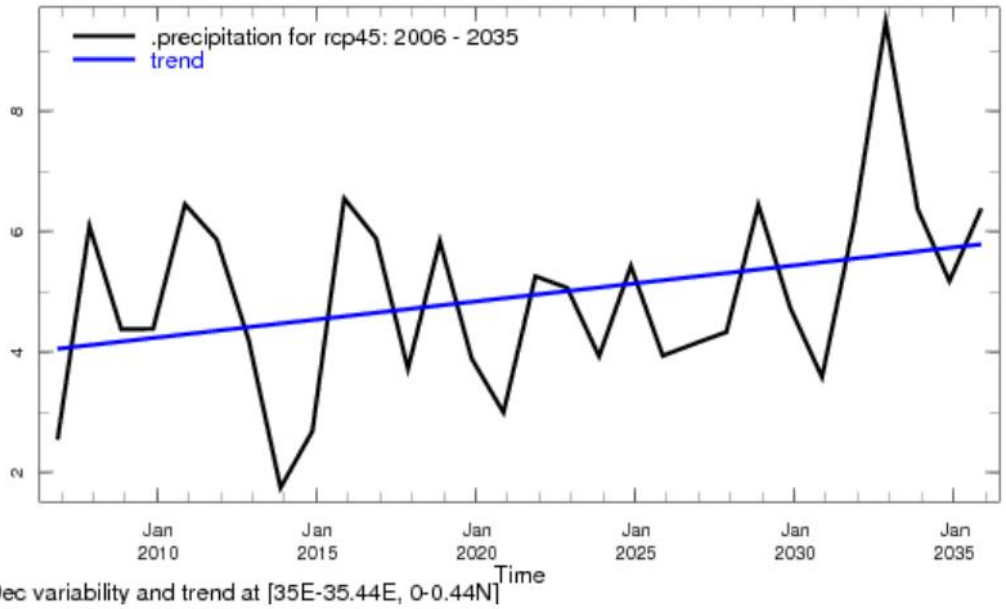
Mar-May variability and trend at [34.32E-34.76E, 0-0.44N]



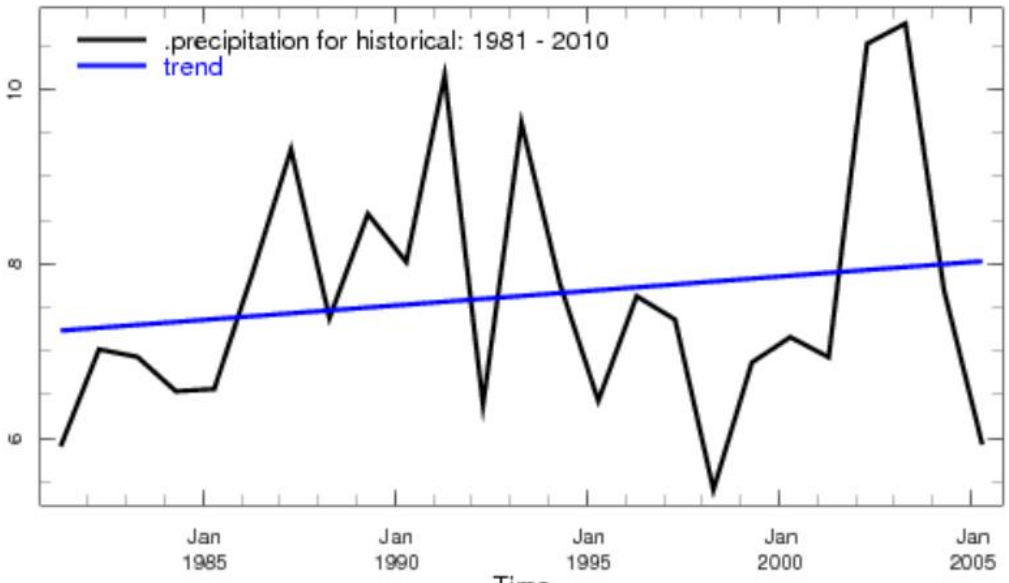
Mar-May variability and trend at [35E-35.44E, 0-0.44N]



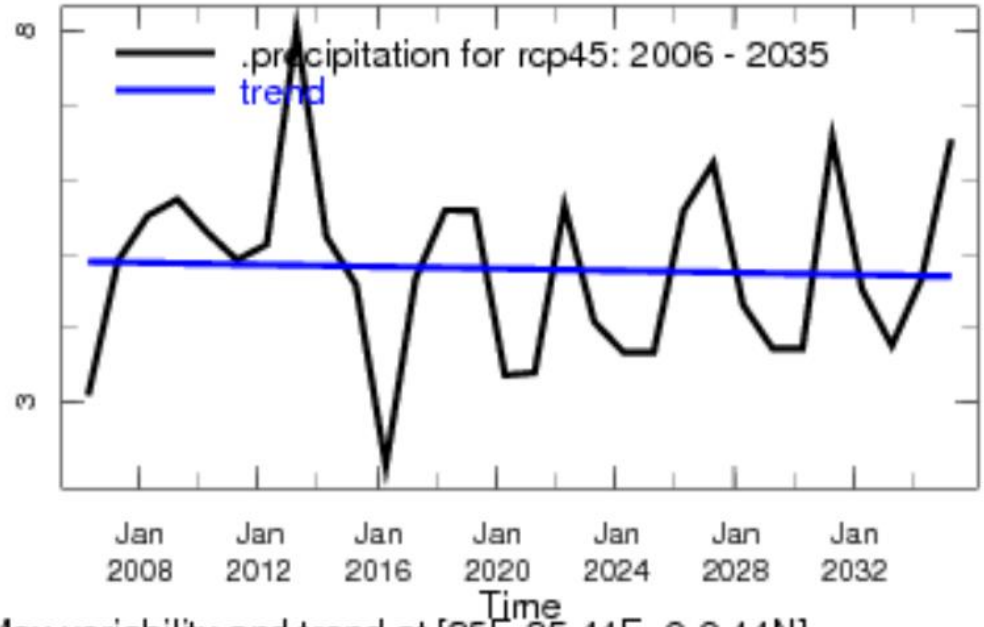
Oct-Dec variability and trend at [34.32E-34.76E, 0-0.44N]



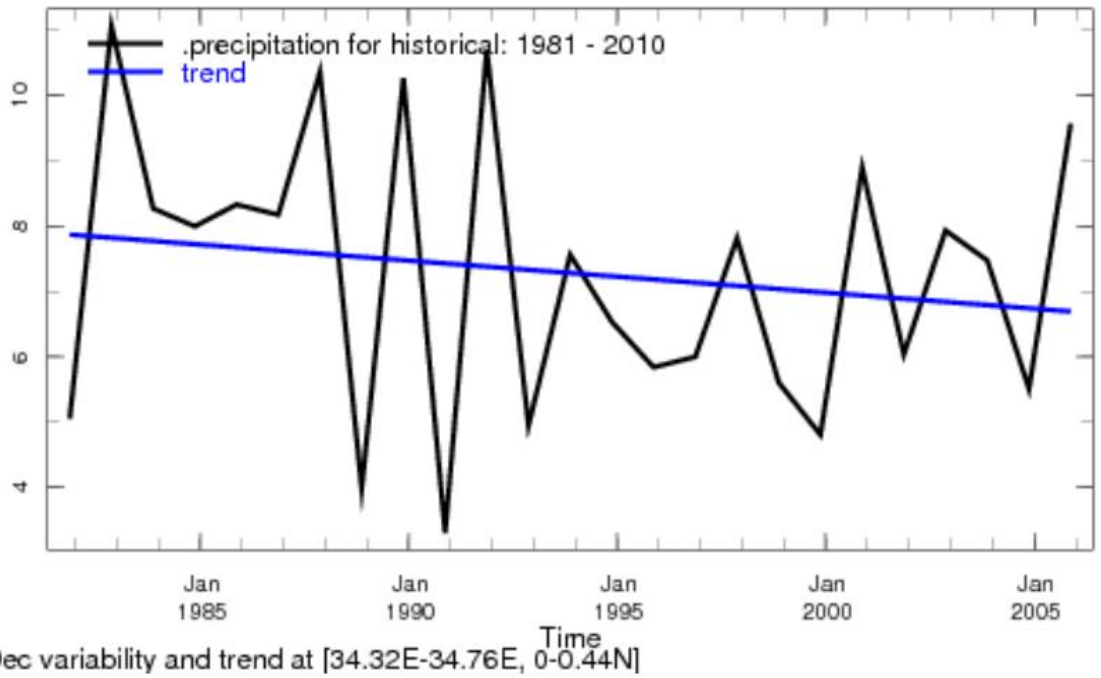
Oct-Dec variability and trend at [35E-35.44E, 0-0.44N]



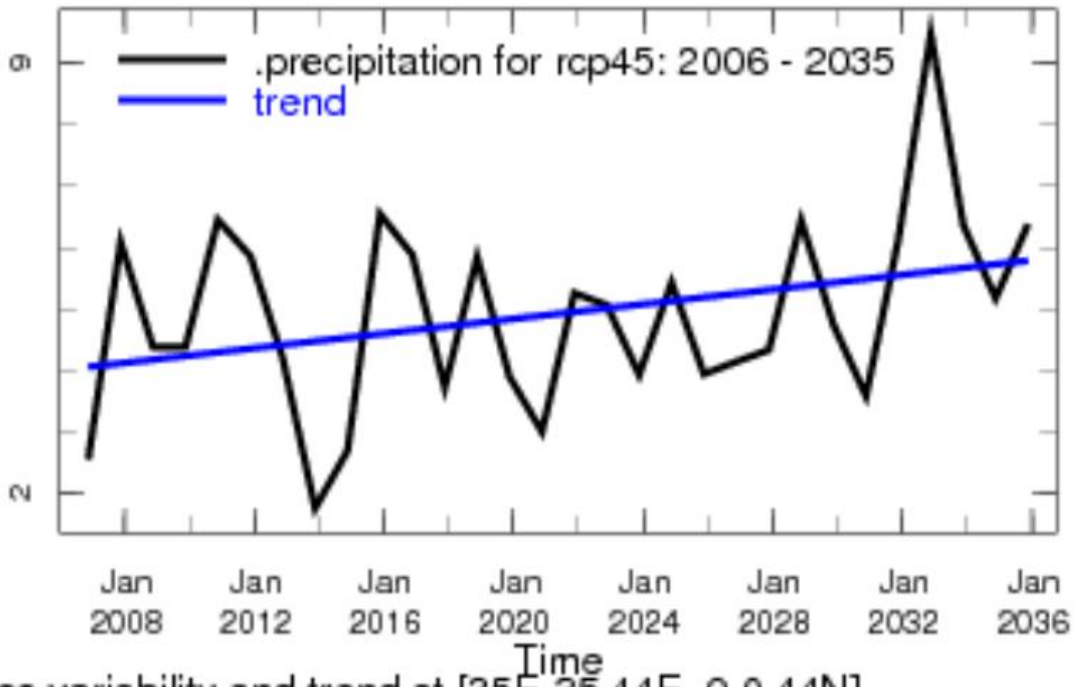
Mar-May variability and trend at [34.32E-34.76E, 0-0.44N]



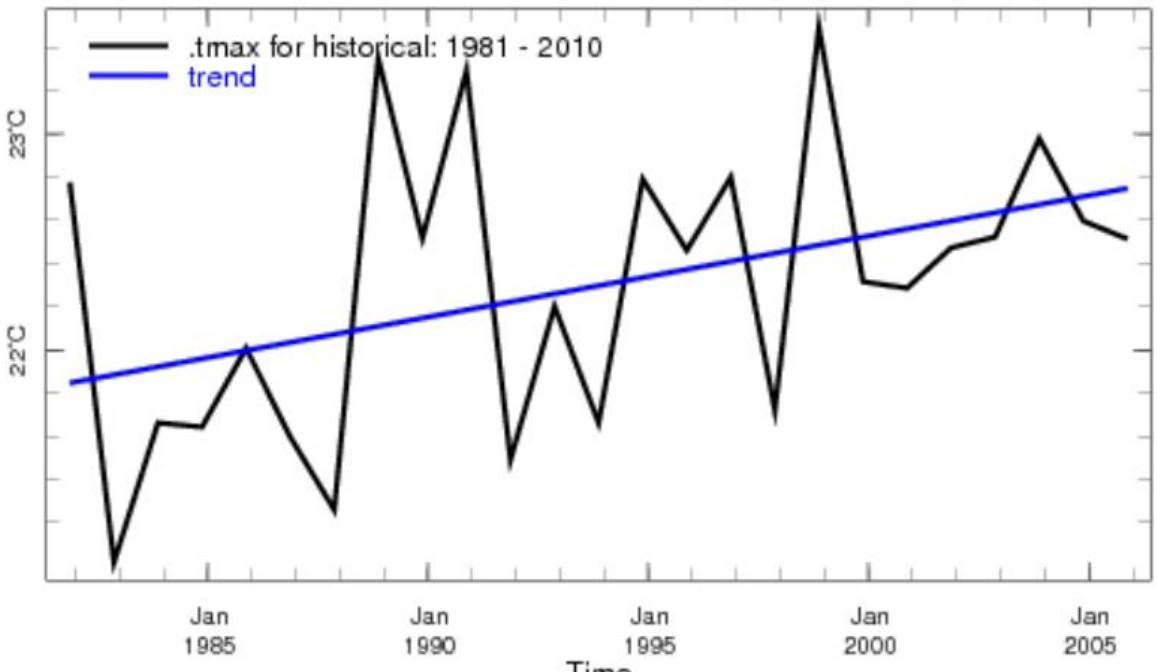
Mar-May variability and trend at [35E-35.44E, 0-0.44N]



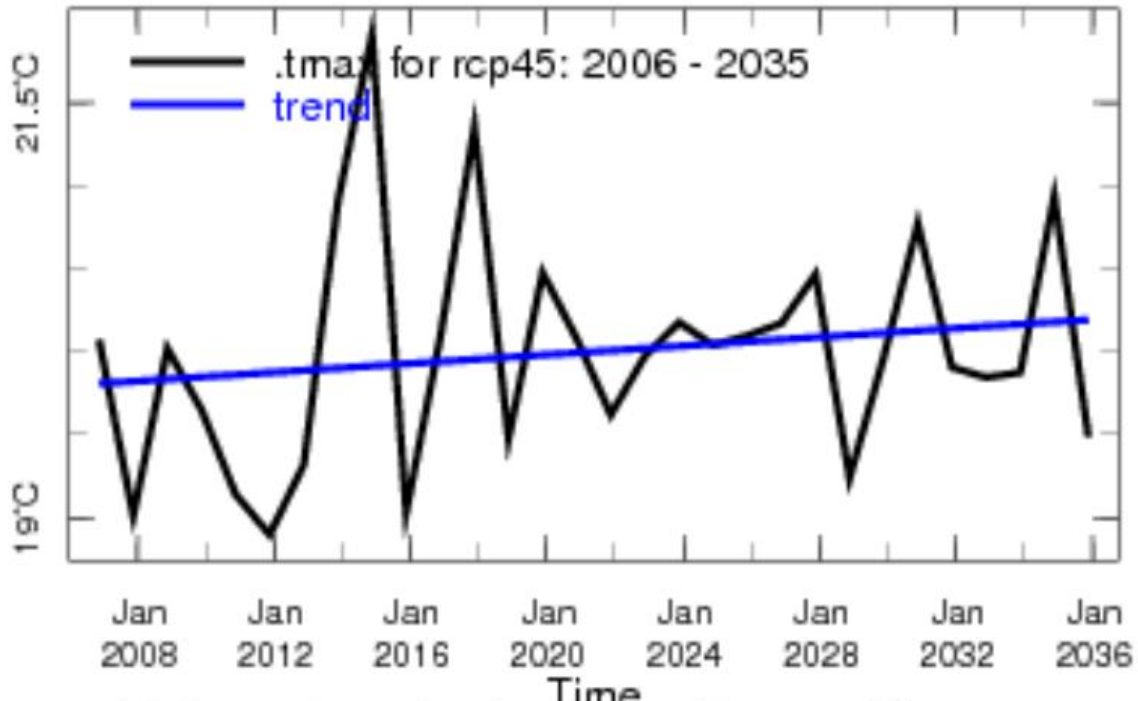
Oct-Dec variability and trend at [34.32E-34.76E, 0-0.44N]



Oct-Dec variability and trend at [35E-35.44E, 0-0.44N]



Oct-Dec variability and trend at [34.32E-34.76E, 0-0.44N]



Oct-Dec variability and trend at [35E-35.44E, 0-0.44N]

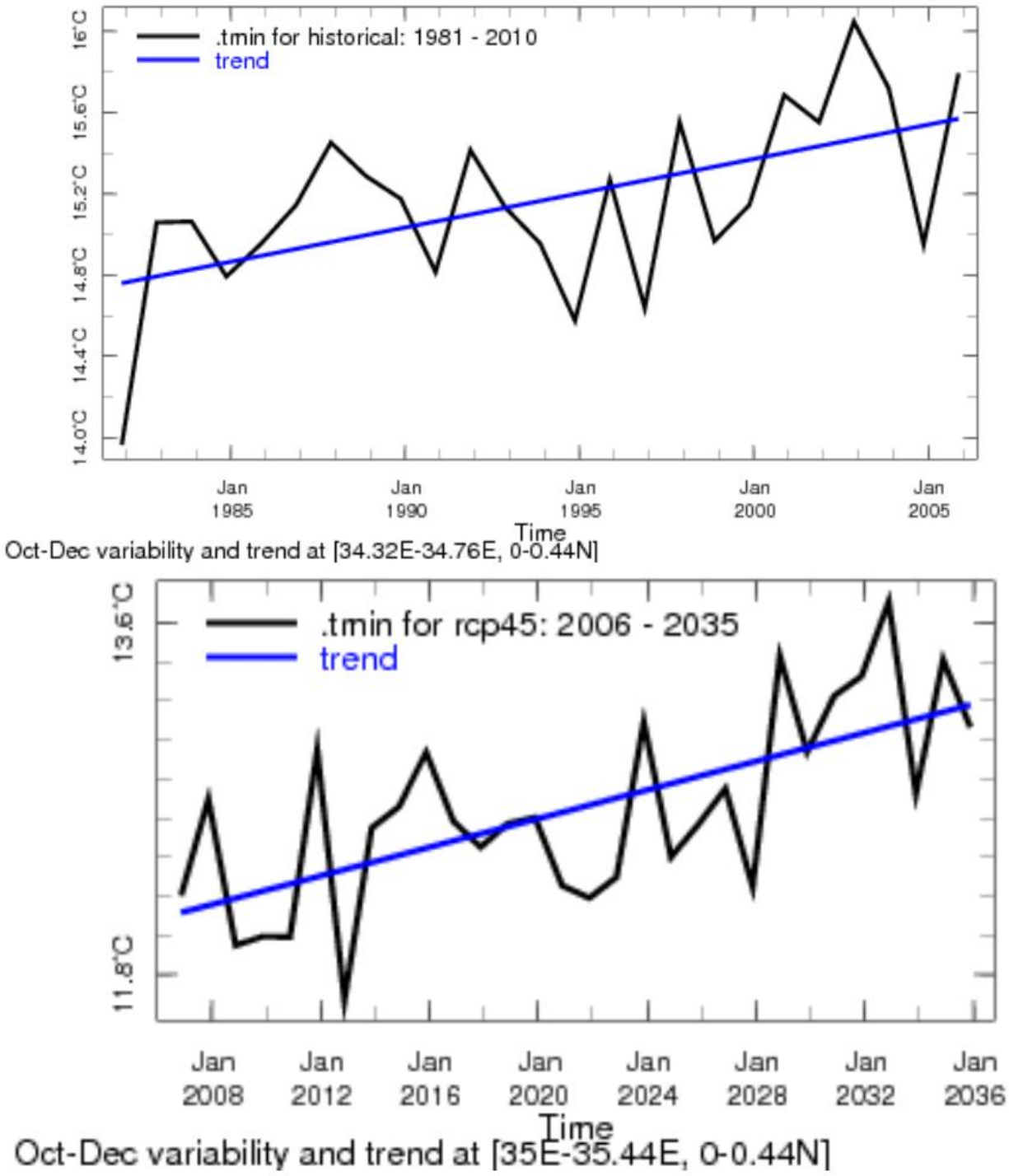


Fig 3.7: Decreasing trend in March to May season and increasing trend in October to December season in historical 1961-1990, 1981-2010 and projected precipitation 2006-2035.

3.2.4. Seasonal trend analysis 1991-2021

March to May and October to December seasonal rainfall show increasing trend

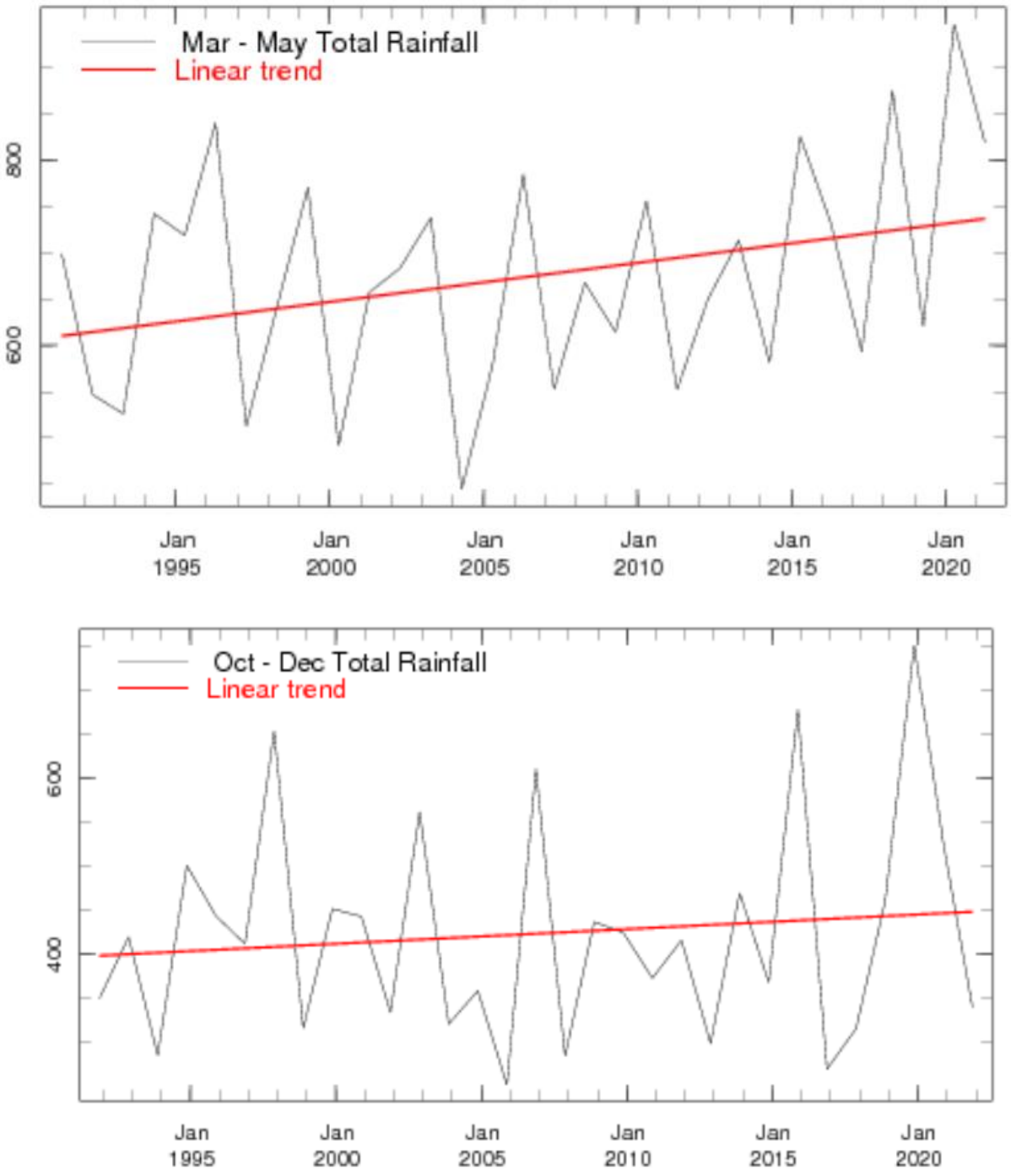


Fig 3.8: Seasonal Rainfall March-May and Oct December

4. ANALYSIS OF EXISTING RESILIENCE/ADAPTATION STRATEGIES TO CURRENT AND FUTURE CLIMATE RISKS IN KAKAMEGA COUNTY

This section presents the strategies that communities and various stakeholders are currently implementing within the county to address the climate-related risks and hazards. The strategies are aimed at supporting livelihood strategies pursued by the majority of the population who are majorly practising agriculture and the rainfed agricultural practices are not sustainable since the rainy seasons have become unpredictable and insufficient. The prevailing climatic hazards in the County mainly are prolonged dry seasons, invasive pests and diseases that leads to water scarcity, drying up of crops and shortage of animal feed, intense rainfall that lead to soil erosion, landslides, floods and crop failure, pests and diseases resulting to loss of crops and livestock, reduced production, landslides which cause loss of lives, destruction of crops and livestock, loss of property and displacement of people floods on the other hand result to loss of lives, loss of property. Currently, in most sub counties, the communities have weak or little management strategies for the pest and diseases invasion. The pesticides available are not efficient to mitigate the effects caused by pests and diseases on livelihood. Further, the current strategies of search for water from available water sources is becoming ineffective as more water sources, particularly rivers, become seasonal due to recurrent and prolonged dry spells.

4.1. Overview of existing adaptation/resilience strategies and their effectiveness to current climate risks

With the increasing episodes and intensity of climatic hazards across the County, the current adaptation strategies will be less effective to mitigate future impacts. These strategies vary in their effectiveness as assessed during this process. As depicted in the current analysis section above (analysis of existing resilience) the strategies used for livelihood enhancement across the county are not sufficient and effective to manage the erratic intensity of climatic hazards.

Climate resilience strategies involve activities and programs that assist the communities to adjust to actual or expected changes in climate to reduce or avoid climate impacts, or exploit beneficial opportunities. Kakamega County has put in place various climate resilience strategies that assist the communities to cope with the harsh effects of climate hazards and therefore helping in post-disaster recovery and reconstruction. These strategies reduce the vulnerability of the community. Table 3.1 below highlights the climate hazards, livelihoods/economic systems that are mostly affected by the hazards, current adaptation strategies and proposed future adaptation strategies to the climate hazards.

Table 4.1: Current and Future Adaptation/Resilience strategies to current and future climate hazards

Risk/Hazard	Livelihood/Economic System	Current Climate Resilience Strategies	Future Climate Resilience Strategies	Stakeholder Group Applying the Strategy	Gender and Social Inclusion information

Lightning	Farming Small-scale business	-Indigenous knowledge -Community awareness	Installation of lightning arrestors Community sensitization	County Government of Kakamega (CGK), National Government (NG), NGOs	PWDs, Women, Elderly, Youth
Floods	-Farming -Sand harvesting -Bee keeping -Livestock keeping	-Evacuation to higher grounds -Climate Smart Agriculture -Tree planting	-Fruit tree planting along the riverbanks -Building or gabions -Clean-up of drainage systems in urban areas. -construction of dams/water pans	CGK NG NGOs KRCS NEMA	Women, Youth
Environmental Degradation	-Mixed Farming -Sand harvesters -Gold mining -Bricks making Bee keeping,	-Tree planting -Water harvesting	-community sensitization on impacts of environmental degradation -Training environmental management groups on diversification	CGK, Support Groups KRCS NEMA Ministry of Agriculture	Women, PWDs, Youth,
Mudslides	-Farming -Livestock keeping	-Evacuation to safer grounds	-Community sensitization on better slope/contour farming methods -Delineate specific areas for agricultural activities on sloppy areas -Plan for and stock adequate supplies likely to be affected.	CGK, NG KRCS	Women, Youth,

			-Put in place measures to support households whose businesses/occupations are destroyed to help the re-start post-disaster.		
Prolonged Dry Spell (PDS)	-Farming -Livestock keeping	-Climate Smart Agriculture	-Construction of dams/water pans	CGK NG NGOs	Elderly, Women, Youth
Invasive Alien Species (IAS)	-Farming -Livestock keeping	-	-Climate Smart Agriculture	CGK NG	Youth, CGK
Hailstones	-Farming -livestock keeping	-	-proper designing of buildings/houses and markets to ensure safety.	CGK NG	Women, youth, PWDs

4.2. Effectiveness of adaptation/resilience strategies to future climate risks

Kakamega County has proposed adaptation strategies in order to help in mitigating future climate hazards. Table 3.2 below show the proposed community activities and their implementation matrix with the aim of mitigation future climate hazards. Furthermore, Table 3.3 below indicates the climate hazards, trends, vulnerable groups impacts and their spatial distribution in Kakamega County.

Table 4.2: Possible community activities and their implementation matrix to mitigate climate hazards in Kakamega County

Hazard	**Community Activity**	**How it will be done**	**Who will implement**	**When it will be done**	**Who will monitor**	**Resources required**
Lightning	Installation of lightning arrestors		CGK NG		CGK Community members	Funds Technical skills Materials
Floods	-Construction of trenches	Community gatherings	CGK NG Support groups	After flooding		

Hazard	Community Activity	How it will be done	Who will implement	When it will be done	Who will monitor	Resources required
Mudslides	-Evacuation to safer grounds		Support groups	During the occurrence of mudslides	CGK	Funds Temporary structures
Environmental Degradation	sensitization of the community on principles of environmental conservation -Tree planting -Improve good governance and implementation of good principles -Train and support environmental management groups to diversify enterprises	Community gathering Seminars and workshops Onsite trainings	Community Groups CGK NEMA, KRCS	Yearly	Community leaders and members	Funds Venue Technical persons Materials for training
Prolonged Dry spell	Construction of small dams for irrigation and livestock production - Sensitization on Climate		Support groups CGK NEMA	Yearly	NEMA, Ministry of Environment	Funds Technical skills

Hazard	Community Activity	How it will be done	Who will implement	When it will be done	Who will monitor	Resources required
	Smart Agriculture					
Invasive Alien Species (IAS)	-Purchase of pesticides -spraying of crops and livestock		CGK Support groups	Immediately the alien species appear.	Ministry of Agriculture	Funds Skilled expertise
Hailstones	Community sensitization on the dangers of hailstones	Community gatherings	Community leaders CGK KRCS	Quarterly	Ministry of Environment NEMA	Funds Skilled personnel

Table 4.3: Climate hazards, trends, vulnerable groups impacts and their spatial distribution in Kakamega County

Sub-County	Prevalent Hazards	Historical Trend	Current Trend	Vulnerable Groups	Exposure and Vulnerability	Impacts (Social, Economic and Environmental)	Spatial Distribution of Hazards
Ikolomani Sub - County	Prolonged dry spells (PDS)	Occasional dry spells	Frequent prolonged dry spells	Women, PWDs, Elderly, School going children, Youth	Lack of Early Warning systems Women lack sustainable sources of income Pests and diseases	**SOCIAL IMPACTS:** Women are exposed to illnesses in search of water. School dropouts due to hunger. PWDs are abandoned and left to die. Death of domestic animals. Low crop yields	Whole sub-county
	Heavy rainfall	Witnessed in March, April May (MAM) but does not lead to flooding	Unequal rainfall in MAM. Also witnessed in October, November, December (OND). OND season was short with equal distribution of rainfall	School going children, PWDs, elderly	Lack of response and recovery plans; No insurance; Low access to grants; The people affected by floods live along the rivers hence vulnerable.	**ECONOMIC IMPACTS** Destruction of infrastructure hence delay in supply of goods and services. Low crop yields hence low income Collapse of mining sites hence loss of income **ENVIRONMENTAL IMPACTS** Death of indigenous plant and animal species	Shibunami, Musanyi Ivechelo Shiaatsule Along R. Yala

Sub-County	Prevalent Hazards	Historical Trend	Current Trend	Vulnerable Groups	Exposure and Vulnerability	Impacts (Social, Economic and Environmental)	Spatial Distribution of Hazards
					Lack of Early Warning systems	Drowning incidents of both human and animals Pollution of water and air	
	Strong winds		Frequent occurrence		Lack of Early Warning systems	Destruction of houses, trees,	All wards
Lurambi Sub-County	Heavy rainfall	Occasional occurrence of hailstones	High frequency of hailstones	Children, women, elderly, PWDs, farmers	Lack of relief aid	Soil erosion, Destruction of infrastructure	Along R. Lusumu, R. Isiukhu, Along the rivers
	Urban floods		Frequent temperature rises especially at night	School going children	Poor drainage systems	Water pollution	Kakamega town
Navakholo Sub-County	Prolonged Dry Spell (PDS)	Short dry seasons (Nov-Dec)	Long dry season (Nov – Mar)	Children, PWDs	Extinction of swamps	Drying of swamps Low crop production Overdependency on one source of income Loss of income Family conflicts	Across all wards
	Lightning strikes		Frequent strikes esp. when it is raining	School going children		Livestock diseases Crop destruction	Shinoyi, Shikomari Maluchira,

Sub-County	Prevalent Hazards	Historical Trend	Current Trend	Vulnerable Groups	Exposure and Vulnerability	Impacts (Social, Economic and Environmental)	Spatial Distribution of Hazards
							Mwikhupi, Kharanda, Bahayi
	Heavy rainfall		Distorted rainfall patterns	Households living along the rivers		Siltation Breaking of river banks River pollution Income loss due to crop destruction Displacement of families	Along R. Lusumu, R. Nzoia,
	Strong winds			Children, PWDs, farmers, women		Blowing of rooftops	Across all wards
Matungu Sub-County	Floods			Households living along the rivers		Displacement of people, livestock	Khalaba, Chwele, Nzoia, Namaba
	Invasive Alien Species (IAS)	No cases experienced	Frequent invasions	Children, elderly, PWDs,	Lack of response mechanisms	Destruction of crops	Across all wards
	PDS	Short seasons of dry spells mostly between	The season is prolonged, from Oct-March	Children, elderly, PWDs	Lack of coping strategies	Malnutrition in children	

Sub-County	Prevalent Hazards	Historical Trend	Current Trend	Vulnerable Groups	Exposure and Vulnerability	Impacts (Social, Economic and Environmental)	Spatial Distribution of Hazards
		Nov-Dec					
Mumias West Sub-County	Lightning strikes	Occasionally occurred	Frequent cases reported			Livestock diseases Crop destruction	Across all wards
	Floods			Households living along the rivers	Lack of Early Warning Systems	Soil erosion Drowning incidents	
	Pests and Diseases		Increased frequency in occurrence		Lack of response mechanisms	Crops destruction Loss of lives Loss of aesthetics due to falling of trees	
Mumias East Sub County	PDS			Children, PWDs, elderly.	Lack of alternative farming options	Low crop yield Malnutrition in children	Whole sub-county
	Floods		Most frequent	Households living along the rivers		Soil erosion Drowning incidents	Along R. Lusumu
	Pests and Diseases		High frequency on occurrence		Lack of response mechanisms	Crop destruction	Across all wards
Khwisero Sub-County	Lightning strikes		High frequency on occurrence	School going children, Elderly, PWDs	Lack of lightning arrestors	Loss of lives	Majorly in Kisa Central ward

Sub-County	Prevalent Hazards	Historical Trend	Current Trend	Vulnerable Groups	Exposure and Vulnerability	Impacts (Social, Economic and Environmental)	Spatial Distribution of Hazards
	PDS		Long dry spell season	PWDs, children, Elderly, Women		Conflicts due to lack of food Crop destruction	Across all wards
	Floods			Households living along the rivers		Breaking of river banks Soil erosion	Along R. Nzoia, R. Yala
Malava Sub-County	Landslides			Households living closer to the hills	Lack of resources	Loss of lives Property destruction Displacement of people	Khuvasali
	Floods			School going children, Elderly, PWDs	Lack of recovery strategies	Drowning Soil erosion	
	Lightning strikes		Frequent occurrence	Children, elderly, PWDs	Lack of lightning arrestors	Loss of lives Property destruction	
Lugari Sub - County	Heavy rainfall			Households living along the rivers		Soil erosion Flooding of river banks Crop destruction	
	PDS		Increased occurrence of dry spells	Children, PWDs, Elderly		Wilting of crops Death of animals Malnutrition in children	
	IAS		Frequent invasions		Lack of coping mechanisms	Destruction of crops	

Sub-County	Prevalent Hazards	Historical Trend	Current Trend	Vulnerable Groups	Exposure and Vulnerability	Impacts (Social, Economic and Environmental)	Spatial Distribution of Hazards
Likuyani Sub-County	Heavy rains	Predictable	Unpredictable rainfall patterns	School going children, PWDs, Elderly	Lack of resources	Displacement of people Drowning incidents	
	PDS	Short season	Long dry spell seasons	The whole community	Lack of coping mechanisms	Wilting of crops Death of animals Malnutrition in children	Whole sub-county
	IAS		Frequent invasions			Crop destruction	Across all wards
Butere Sub-County	PDS			Children, elderly, PWDs		Poor crop yields Malnutrition in children	
	Floods			Households living along the rivers	Lack of relief support	Soil erosion Destruction of fish ponds, homes, roads, Waterborne diseases	
	Hailstones		Frequent occurrence	Women, school going children		Crop destruction	
Shinyalu Sub-County	PDS				Lack of coping strategies	Low crop yields hence low income Malnutrition in children	
	Floods			School going children, Elderly,	Lack of response mechanisms	Soil erosion Destruction of fish ponds, homes, roads,	Across all wards

Sub-County	Prevalent Hazards	Historical Trend	Current Trend	Vulnerable Groups	Exposure and Vulnerability	Impacts (Social, Economic and Environmental)	Spatial Distribution of Hazards
				Women, PWDs	Lack of resources	Spread of Waterborne diseases die to pollution of water sources	
	Lighting strikes				Lack of lightning arrestors	Loss of lives	Murhanda Shamiloli

4.3. Summary Analysis of Climatic Impacts Adaptive Capacities and Vulnerabilities According to Sector

a) Agriculture Sector

i. Description

Agriculture is the backbone of the Kakamega County's economy, and the largest sector, contributing to 52.2 percent of the Gross County Product. The County aims to improve food security through increased crops, livestock, and fisheries production. For food crop production, the sector produced 2.5 million bags (90 kg) of maize up from 1.9 million bags (90Kg) in 2018 (CIDP 2023). While there are moves to commercialize agriculture, it remains largely subsistence-based. Agricultural productivity and levels of technology adoption are low.

ii. Impacts

Agriculture has been, and stands to continue to be, one of the hardest hit sectors by the effect of climate change. The County experiences low crop production and productivity occasioned by Poor quality farm inputs; high Prevalence of Pests and diseases; Poor soil management practices; Land degradation; poor Crop husbandry production practices; High cost of production; and diminishing agricultural land sizes.

A bigger percentage of the County's population is dependent on rain fed agriculture. The sector is highly susceptible to climate variability, including temperature rise, changes in precipitations, and extreme climate events. Extreme variability causes poor plant growth, on-farm losses and poor crop productivity. An example is the El Nino that occurred in 2018 that caused crop failure. An incident such as excessive rainfall and floods causes post-harvest losses. The County's economy is dependent on agriculture. There has been emergence of pests and diseases including fall army worms and African army worms that caused maize destruction in the year 2020. In the year 2022, poor yields were experienced because of delayed rainfall and cases of hailstorms in some areas. During the heavy rains, there has been soil erosion on crop farms, destruction of crops, increase in crop fungal diseases. Similarly, zoonotic diseases have been on the rise due to climate change, animal migration and vector biology that have greatly influenced the emergence, re-emergence, distribution, and patterns of zoonoses. There is also high prevalence of livestock pests.

The manufacturing factories in the county, for instance, sugarcane processing, proposed dairy plant, maize meal and tea factory rely/or will rely on agricultural raw materials which are greatly affected by climate change. Dry spells cause shortage of pasture and water affecting production of livestock. During heavy rainfall, access roads become impassable.

iii. Adaptive capacities

On a national level, adaptive capacity in the agricultural sector is reflected through key enabling and supportive policies. Examples of this include the Agriculture Sector Development Strategy (ASDS) 2010-2020. The ASDS is the blue-print of the agricultural sector to implement Vision 2030. It sets out a detailed plan to "position the agricultural sector as a key driver for delivering

the 10% annual economic growth rate envisaged under the economic pillar of Vision 2030". It envisions "a food-secure and prosperous nation" and aims to increase productivity; commercialization and competitiveness of agricultural commodities and enterprises; and develop and manage key factors of production. The Strategy advocates for sustainable land management and scaling up of appropriate technologies suitable for drought-prone areas. It further proposes programs for mitigation and adaptation to climate change. At the county level, there exist County crop protection unit; soil testing facilities; adoption of emerging production technologies and Semi-Autonomy of the corporation of Kakamega Dairy Development Corporation (KDDC); Existence of vaccination programmes; and an ongoing Smart Agriculture programme.

At the community level, efforts to cope and positively respond to climate change impacts include small scale irrigation along Rivers such as Nzoia, Isiukhu and Yala, planting drought resistant crops e.g. cassava and millet; eating wild fruits and food; planting short season crops, food preservation; planting cover crops; planting of fodder crops; adoption of agroforestry; practising conservation agriculture; post-harvest management; use of compost manure, legume-crop inter-cropping and introducing agroforestry practices. Other possibilities which exist but have not yet been employed include establishment of irrigation systems, use of multiple sources of water in dams and fodder preservation in Silos. Efforts to combat soil moisture loss could include low tillage agricultural practices, the use of organic manure and compost, mulching, cover crop and mixed cropping practices.

As water availability (or the lack thereof) is a primary concern, adaptation options might include drip irrigation, drilling of boreholes in order to access groundwater, experimenting with drought resistant crop varieties and promoting deep rooted crops. Broader land use options might include the introduction of shelter trees into sugarcane farms, developing upstream and downstream water management strategies and the application of integrated, landscape management for water conservation objectives.

Integrated pest management is an angle which may be included and may involve agroforestry or the introduction of other natural barriers to pests. Fundamentally, however, it will likely be necessary to diversify not only crops, but also sources of livelihoods. Capacity building of farmers both in adaptive agricultural practices and other livelihood activities would be helpful.

iv. Vulnerabilities

Given the county's heavy dependence on rain fed agriculture, there are high levels of vulnerability to even minor climatic changes or shocks. Agriculture sector vulnerabilities in most wards can be understood according to several key vulnerabilities. Kakamega's climate is classified as tropical and experiences rainfall throughout the year. This is mainly attributed to the existence of Kakamega rain forest which is the only remaining tropical forest in Kenya. The annual rainfall in the county ranges from 1280.1mm to 2214.1mm per year. The rainfall pattern is evenly distributed all year round with March and July receiving heavy rains while December and February receive light rains. However, the distribution of rainfall varies between sub counties, where by Likuyani. Lugari and furthest part of Khwisero receives minimum rainfall as indicated in Figure 4.1 below.

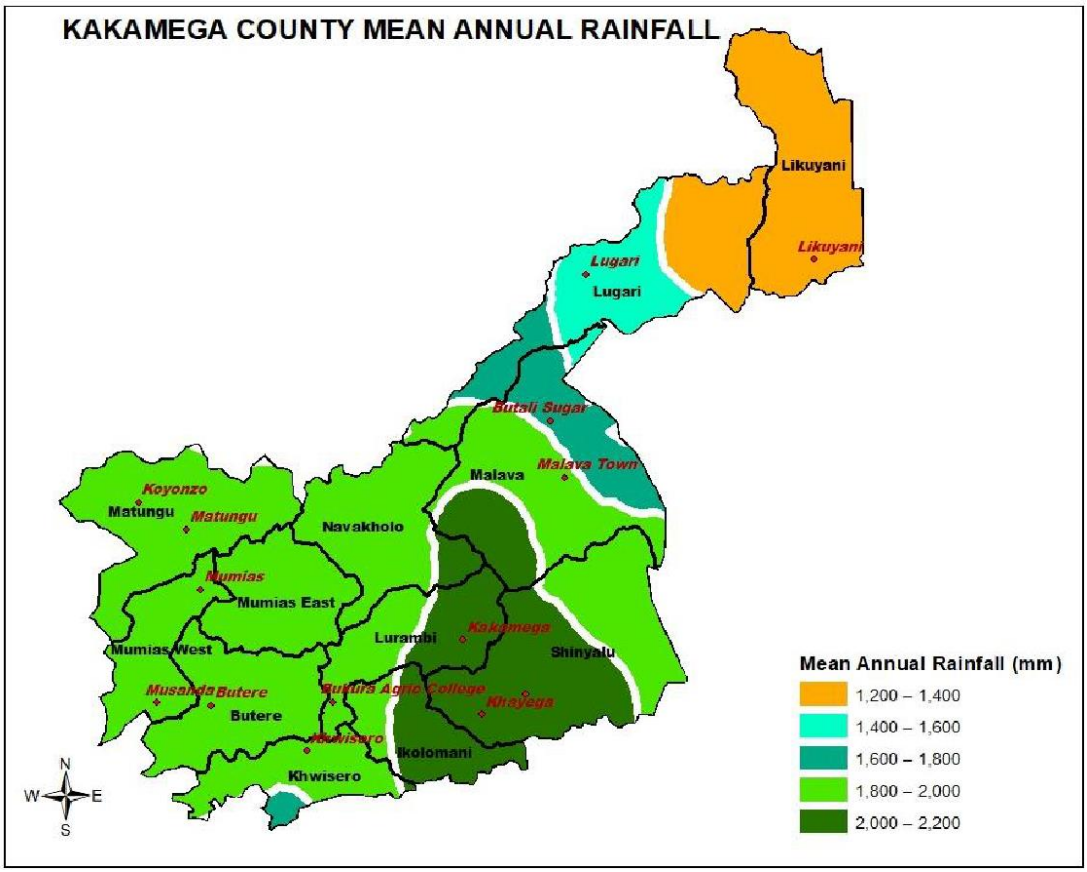


Fig 4.1: Rainfall variability by sub-county

Since the early 1960s both minimum (night) and maximum (day) temperatures have been on a warming trend throughout Kenya. Current projections indicate increases in temperature. Recent trends show a marked increase in inter-annual variability and distribution of rains, with an increase in the number of consecutive dry days and shorter but more intense periods of rainfall resulting in an increase in frequency of floods. Future climate change may lead to a change in the frequency or severity of such extreme weather events, potentially worsening impacts. Increased average temperatures and changes in annual and seasonal rainfall will be felt across key economic sectors, such as agricultural production, health status, water availability, energy use, infrastructure, biodiversity and ecosystem services (including forestry and tourism). Impacts are likely to have disproportionate effects on the poor as such groups have fewer resources to adapt to climatic change and vulnerability.

This climatic change creates vulnerability to climate-related threats such as pests, weeds, declining soil fertility and increasing costs of production, including labour. While there is interest in moving away from community dependence on a single crop, exploring other integrated land management strategies depends on the availability of sufficient water to support other cropping alternatives. Exploring as alternative sources of livelihoods are necessary to bring areas with low rainfall to benefit from other income generating activities, or to even withstand prolonged climatic stress and loss of income. However, such interventions are capital intensive and require development of necessary infrastructure.

b) Forestry and Environment sector

i. Description

Kakamega County has one of the highest population densities in Kenya, a population which directly relies on the natural resources available for livelihood. Forests, wildlife, water, rich soils and abundant rainfall are a basis for livelihoods in the County. Kakamega County has a natural forest covering Shinyalu and Lurambi while other farm forests have been integrated with agricultural farming. The natural forest covering an approximate area of 188.7 km 2 is gazetted. Commercial forests are found in the northern parts of the County in Lugari constituency.

The County has six gazetted forests namely Kakamega, Malava, Bunyala, Lugari, Misango hills and Kisere Forest Reserve with a total of 33183.6 hectares. The Kakamega Forest is within the vicinity of the County headquarters and is rich with indigenous trees and wildlife which forms a tourist attraction within the region.

The main forest products from the two types of forests includes firewood and charcoal as fuel, medicinal plants, honey for commercial and domestic consumption, timber for construction of houses. The commercial forests produce poles for sale to Kenya Power and Lighting Company (KPLC) among others. The forests are also used as sites for research and development by a number of institutions.

Forestry is also closely interlinked with agriculture, energy production and rural livelihoods. Fuelwood is the principal source of rural energy within the country as 80.8% of the population depend on firewood whereas 8.2% depend on charcoal. Forests products have become an important source of income for rural poor and provides herbal medicines for primary health care. Forests provide important regulatory functions and provisioning ecosystem services, mitigating climate change and generating raw materials for industry, in addition to livelihoods of rural communities.

ii. Impacts

Forests are impacted significantly by Climatic factors including impact on the fruiting and flowering cycles of trees as a result of changing seasonality, loss of soil moisture in the forest areas which is believed to be cause for loss of a range of fodder grasses and temperature increases, which are likely responsible for shifting eco- zones and forest species composition. A number of indigenous trees species are declining or have disappeared altogether, the productivity of the forests has been negatively impacted by declining rivers (and possibly ground water) levels. Conversely, the forests have been damaged due to prolonged dry spell, wild fire and emergence of invasive species such as Guavas (Psidium guajava) and Lantana camara. In addition to these, there is notable evidence of climate change including new parasitic plants e.g. Cascuta dodder, increased land degradation, increased intensity of forest fires, bird migration to other areas, a shift in agricultural seasons due to erratic rainfall.

Specifically, the community has expressed concern at the loss of important fruit species,

medicinal plants, and vegetables. There was specie of grasses that were predominantly found in forest areas such as depressions that were often wet year-round. However, due to growing dryness and prolonged dry spell, these grasses have become extremely difficult to find.

As mentioned, changes in the phenomenology of tree species are also observed in the forests. Also, availability of wild mushrooms, relied upon by the community for consumption and sale has also been significantly reduced, presumed to be as a result of changing rainfall patterns.

iii. Adaptive capacities

Afforestation and reafforestation have been ongoing to mitigate against flooding and landslide events, and to improve water quality and quantity within watershed areas and on hillslopes. The Kenya Forest Service has spearheaded major afforestation drive within gazetted forests and on farm and has been instrumental in disseminating knowledge and information on climate change to its members. Community forest Associations have been developed to ensure community's a participation in natural resource governance.

The County Government has been able to promote nature-based enterprises and has fully supported adoption of alternative livelihoods to compensate for limited adaptive assets amongst women. Examples include establishing bamboo plantations along riparian corridors and establishment of community tree nurseries. Communities have invested in planting of eucalyptus tree species which remain a potential of ground water reduction due to its high-water intake capability and allelopathic effect.

Reducing overreliance on use of fuel wood and charcoal has been difficult for the communities living around the forest because of prohibitive costs of alternative energy sources. However there exist vibrant groups that participate in conservation through established social capital for the poor and put in place the building blocks of climate change resilience.

iv. Vulnerabilities

The poorest members of these the community rely disproportionately on forests for firewood, fodder/pasture, consumption and medicine, thatching grassland for the water regulatory services the forest provides. All of these will increasingly be impacted by climate change.

The availability of fuelwood, particularly for the poor, has been drastically reduced because of broader impacts of deforestation and forest degradation. A significant number of households are able to generate fuelwood from the trees grown on private land, rather than relying exclusively on the community forest as well as having the means to purchase liquified petroleum gas for cooking. Women and children are almost exclusively responsible for fuelwood collection and for household energy security.

c) Water Sector

i. Description

Kakamega County has a number of water resources which are a significant asset for the county's current economic development. The abundance of all-weather river water resources and availability of waterfalls and river confluence provide ample opportunities for hydropower production. Some of the main rivers traversing the county include Nzoia, Yala, Lusumu, Isiukhu, Shiatsala, Firatsi, Kipkaren and Sivilie. These rivers have high potential for irrigation, opportunities for domestic purposes and huge potential of hydropower. The County has many streams and springs, some of which are subterranean and are prone to impacts of climate change. Kakamega County's Forest ecosystems are endowed with rich biodiversity, some of which are rare fauna and flora. These ecosystems are of great hydrological importance by contributing to large volumes of water to rivers within the county and also influencing the rainfall pattern in the region.

There are also hills such as Kambiri, Misango, Mawe Tatu and Maturu which provide great opportunities for gravity water schemes.

ii. Impacts

Land degradation in the Cherengani water towers and the Yala basin in particular with repeated exposure to prolonged dry spell has led to negative impacts on the hydrological systems of the County. The effect of prolonged dry spell and in some cases wild fire has led to deforestation and eventually decline in quality of water as exemplified in heavy sedimentation in many rivers and, eventually, an increase in the incidence of flooding. Community perceptions suggest that the loss of the upstream forest has led to noticeable and rapid changes in the local environment.

Pronounced drought and erratic rainfall has coincided with a growing demand for water within the area for small scale irrigation and domestic use. This has also coincided with a growing incidence of pollution and other factors that limit the availability of potable water and increase the potential for future water resource conflicts. Agriculture in many parts of the county is mainly rain fed, and over the past few years, rain fed as well as irrigated crops are being badly affected by prolonged dry spell, flooding, erratic rainfall and other extreme weather events. Wetland crops such as yams can no longer be grown in some parts of Navakholo sub county.

iii. Adaptive capacities

The coping mechanisms of the community in the water sector are in the form of shallow wells, spring protection and conservation, use of irrigation hose pipes, retention ponds and rain water harvesting. There is a strong social capital for spring protection, riparian area conservation and use of related water. Most springs and streams are affected in the dry months of November, December, January and February. In addition to surface water and shallow water sources, there is also the water table which is lowering, but may be accessible through deep drilling.

iv. Vulnerabilities

The need for secure access to water for irrigation, livestock and human consumption are major vulnerabilities for the community. There is considerable notable and gradual drying up of natural water bodies and the community shallow wells exposing them to risk of being insecure, especially persons with disability who may not be financially stable to explore alternative sources of water for their livestock, agriculture and domestic use.

Water and weather are the primary elements through which climate change is felt. Climate change has directly impacted on water resources affecting water security. In order to achieve the Sustainable Development Goal on Clean Water and Sanitation, climate change adaptation will have to build climate resilience especially by strengthening promotion of healthy ecosystem services that rely on well-functioning river basins. It is imperative that climate change interventions reflect the importance of water management in reducing vulnerability and building climate resilience. Deliberate efforts are therefore necessary towards ensuring its sustainability.

4.4. Identifying Adaptation Options

Other important sectors and assets that contribute to economic development of the County such as education, health, employment and infrastructure are also impacted by the effects of climate change, focus on forestry, agriculture, livelihood and water sectors presents an assessment of climate change vulnerabilities in the county. This provides a direct causal links between climate change threats and possible adaptation options for the county. High priority vulnerabilities include:

a) Prolonged dry spell- declining productivity of agricultural crops due to decreasing land productivity, unpredictable rainfall patterns and increasing cases of invasive pests, weeds and diseases, decreasing income from cash crops due to loss of productivity, over dependence on maize leaves the community without alternative sources of income, increasing workload of women as a result of drying water springs, which traditionally has been the main domestic water sources, Reduced water levels in rivers to ensure to diversify agricultural-based sources of livelihood. There is also decreasing indigenous tree diversity affecting access to nutrition
b) Heavy rainfall- result into destruction of poverty, crop failure, emergence of pests, prevalence of water and vector borne diseases
c) Prevalence of invasive pests and diseases- communities living in lowland areas or fragile ecosystems are prone to flood and infrastructure is at risk of destruction.

Potential adaptation response areas identified and prioritized with the community for further refinement and feasibility assessment have been narrowed down to the following:

Table 4.1: Hazard and affected sector

Risk/Hazard	Sector affected
Prolonged dry season/spell	Food and Nutrition Security; Water and the Blue Economy, Forestry, Wildlife and Tourism, Health, Sanitation and Human Settlements, Manufacturing, Energy and Transport
Floods	Food and Nutrition Security; Water and the Blue Economy, Forestry, Wildlife and Tourism, Health, Sanitation and Human Settlements, Manufacturing, Energy and Transport
Prevalence of invasive pests and diseases	Food and Nutrition Security; Water and the Blue Economy, Forestry, Wildlife and Tourism, Health, Sanitation and Human Settlements, Manufacturing, Energy

These sectors form part of the target areas for intervention. Affirmative programmes will be spearheaded to target Disaster Risk Reduction, an area of concern.

5. CLIMATE STRATEGIC ADAPTATION INVESTMENT/ACTION PRIORITIES

The Participatory Climate Risk Assessment (PCRA) data collection process highlighted the need to invest across the county in socio-economic sectors that are affected by Climate Change. The key PCRA output focused sectors included: forestry and environment, water, energy, agriculture (crop and livestock productions). The adaptation options also related to the livelihoods and assets across the sub-counties including business enterprises, forests, water points (rivers, streams, dams), infrastructures (roads, mine lands).

5.1. Effectiveness of adaptation/resilience strategies to future climate risks

With the increasing episodes and intensity of climatic hazards across the sub-counties, the current adaptation strategies will be less effective to mitigate future impacts. These strategies vary in their effectiveness as assessed during this process. As depicted in the current analysis section above (analysis of existing resilience) the strategies used for livelihood enhancement across the sub counties are not sufficient and effective to manage the erratic intensity of climatic hazards.

In this section, it is outlined the climate-related hazards with affected livelihood, ranked adaptation strategies and the community segment applying the strategy as well as the gender consideration in the strategy per sub-county. The ranking was done by popular classification which considered the cost of the strategy, the current rate of use, and its technical/operation effectiveness.

5.2. Summary of Hazard and Priority Areas

Across the County, key hazards identified were prolonged dry spell and heavy rainfall, which in turn come with other risks including invasive species, hail storms, thunderstorms, waterborne and vector diseases and floods. These sectors are summarized with identified potential areas for investment.

Table 5.1: Hazard and priority areas of investment

Risk/Hazard	**Priority Areas of Investment**			
	Water	**Agriculture**	**Environment, forestry and wildlife**	**Infrastructure, Manufacturing and Energy**
Prolonged dry season/spell	Drilling of boreholes, Dissemination of climate information.	Climate smart Agriculture (CSA), Irrigation, Promote high yielding crop varieties, drought resistant and agricultural diversification, small scale irrigation	Adoption of green energy options	Climate proofed infrastructure Adoption of Renewable energy mechanisms like solar

Heavy rainfall	Bulk water harvesting and storage, Dissemination of climate information, multiple use of water	Support initiatives on climate smart technologies, enhanced access to climate information services, investment in blue economy	Afforestation, Agroforestry	Climate proof construction
Prevalence of invasive pests and diseases	Dissemination of climate information.	Adoption of climate resilient varieties and breeds, Capacity building, Crop pest and disease control	Support initiatives on climate smart technologies	Climate proof infrastructure to avoid contamination by storm water

5.3. National and Local level financing opportunities for adaptation

Adapting to climate change is a complex process that necessitates a comprehensive understanding of risks, vulnerabilities, and levels of exposure. It demands significant capital investment, time, and resources to mitigate these risks and reduce vulnerabilities. One of the key strategies in this process is to enhance the capacity of communities to respond to climate change impacts. This can be achieved by improving access to climate information and building resilience to climate effects.

In addition to capacity building, it is crucial to provide technical and financial resources to communities. These resources can be used to implement adaptation measures, develop climate-resilient infrastructure, and support sustainable livelihoods. Furthermore, enhancing access to government services through extension services can play a significant role in supporting adaptation efforts. Extension services can provide valuable information and training to communities, helping them to better understand and respond to climate change impacts. However, a lack of access to these resources can significantly increase a community's vulnerability to climate change. Despite the critical need for climate finance, many areas are not accessing available climate finance instruments. This is a significant challenge, as these instruments can provide the necessary funding for adaptation measures. There exists a myriad of potential options for adaptation financing at both the national and local levels. These include government funding, international climate funds, private sector investments, and innovative financing mechanisms such as green bonds and climate insurance.

To ensure effective adaptation to climate change, it is essential to increase awareness of these financing opportunities and build the capacity of communities and local governments to access and utilize these funds. This will require concerted efforts from all stakeholders, including government agencies, non-governmental organizations, the private sector, and the communities themselves. By leveraging these financing opportunities, we can enhance community resilience to climate change and ensure a sustainable future. Available funding mechanisms are illustrated hereunder:

5.4. Financing Locally Led Climate Actions(FLLoCA)

The County is benefitting from Financing Locally- Led Climate Action (FLLoCA), a conditional Programme for Results(PfR) World Bank funded through the National Treasury. So far, two disbursements of County Climate Institutional Support (CCIS) grant, amounting to 11m each has been approved and disbursed into Kakamega County Revenue Account to strengthen climate risk management capacity, establishment of County Climate Change units and County Climate Change Fund, development of supporting policy and legislative and institutional framework, upscale community sensitizations and establish Climate Information. The County has managed to meet all these conditions in addition to other minimum performance conditions required to access County Climate Resilience Investment(CCRI) grant.

5.5. Green Climate Fund

The Counties in the Lake region Economic Bloc(LREB) have jointly developed a proposal "Transforming Livelihoods through Climate Resilient, Low Carbon, Sustainable Agricultural Value Chains in the Lake Region Economic Bloc, Kenya (CRLCSA)" together with Food and Agriculture Organization to access Green Climate Fund. The

5.6. County own Climate Funding

The County has allocated 1.5% of development budget toward climate change adaptation and mitigation to build the resilience of the communities particularly the most vulnerable. In the FY 2023/24 the county has allocated 109 million towards climate change actions.

6. CONCLUSION

Kakamega County undertook a comprehensive Participatory Climate Risk Assessment (PCRA) across its 60 wards, spanning twelve sub-counties. The PCRA process also identified robust, broad thematic adaptation investment areas that can address the current and future climate vulnerabilities of different groups. The report serves as a testament to the county's commitment to climate action and resilience building. This initiative underscores the county's commitment to integrating climate and disaster risks into community planning and development. The PCRA served as a pivotal tool for gauging the impacts of climate risks on livelihoods in both urban and rural settings, with a particular emphasis on involving vulnerable communities in the assessment and adaptation strategy formulation.

Key takeaways from the PCRA included:

1. Active engagement of diverse stakeholders, including women, youth, Persons with Disabilities (PWD), and other marginalized groups.
2. Development of ward-specific hazard, asset, and resource maps.
3. Identification of key livelihood resources, assets, and areas at risk from various hazards.
4. Formulation of ward-specific action plans aligned with broader climate change strategies.

The outcomes of the PCRA have been integrated into the Kakamega County Climate Change Action Plan, aligning with both the County Integrated Development Plan 2023-2027 and the National Climate Change Action Plan 2023-2027. The county has further fortified its commitment to climate change mitigation and adaptation through the establishment of governance structures, legislative frameworks, and policy measures. Critical focus sectors and areas on climate actions include environment/forestry, infrastructure, water, agriculture (food and nutritional security) and Disaster Risk Reduction. This relates to the protection of livelihoods involving forests, water sources, agricultural fields and practices, and food security.

On a broader scale, Kakamega County's initiatives resonate with international and national commitments, including the Paris Agreement, Kenya's Vision 2030, the Climate Change Act, 2016, and the SDGs. The county's endeavours are a testament to its dedication to fostering a sustainable and resilient future for its inhabitants.

7. References

COUNTY GOVERNMENT OF KAKAMEGA: County Integrated Development Plan(CIDP) 2023-227

Kenya Meteorological Department [KMD] (2018). Review of Rainfall during the March to May 2018 “Long Rains" Season and the Outlook for the June-July-August 2018. Nairobi: Ministry of Environment and Forestry.

Kenya Meteorological Department (2017), Climate Change Risks.

Kenya Meteorological Department [KMD] (2018). Review of Rainfall during the March to May 2018 “Long Rains” Season and the Outlook for the June-July-August 2018. Nairobi: Ministry of Environment and Forestry.

World Bank Group (2018). Data for Lower middle income, Kenya. Retrieved from: https://data.worldbank.org/?locations=XN-KE

Kenya National Bureau of Statistics [KNBS] (2019). Spatial Dimension of Well-Being in Kenya: Where are the Poor? Nairobi: KNBS.

County Government of Kakamega: Disaster manual 2018

Annexes

Annex 1: Kakamega County Climate Change stakeholder in Agriculture sector

Sno.	Name of local & other stakeholders	Sector	Focal Person	Phone Number	Ward
1.	New-Vision CBO	Agriculture	Jemimah Mmayi		Malaha Isongo
2.	Faith based	Catholic Church	Peter Kongani	0705220139	Malaha Isongo
3.	Faith based	Muslim	Ishmael Shikanda	0720615970	Malaha Isongo
4.	Isongo CDDC	Agriculture	Laurence Mukabaana	0723860677	Malaha Isongo
5.	CJBC Catholic Justice Peace Commission	Church (Advocacy)	Xaviour Makokha	0728655574	Malaha Isongo
6.	Sugarland Sweet potatoes Producer and marketing Group	Agriculture	Joseph Arambee	0725123271	Malaha Isongo
7.	Bidii Women Groups	Agriculture (Sweet potatoes)	Mary Opote	0720627693	Malaha Isongo
8.	Participatory Approaches for Integrated Development (PAFID)	Conservation agriculture Agroforestry	Dan Asaka	0733232865	Sub County
9.	Men and Traditions Against Aids (MTAA)	Gender mainstreaming on HIV/AIDS (Advocacy)	Getrude Lwanga	0722444228	Sub County
10.	GIZ/WHH	Agriculture (carbon credit)	Abubakar	0734684373	Sub County
11.	Rural Information Agricultural Development Centre (RIADEC)	Soil & water conservation Agroforestry Local vegetables River bank protection	Simon Wesechere	0756683850/ 0725288253	Lusheya Lubinu
12.	Anglican Development Services (ADS)	Sweet Potatoes	Mary Ombuna	0713781517	Lusheya Lubinu
13.	Ikoshe Empowerment	Forestry	David Wabuti	0700841962	Lusheya Lubinu
14.	Lusheya Lubinu Farmers CBO	Agriculture (Sweet Potatoes)	Protus Wabuti	0704339555	Lusheya Lubinu
15.	Sweet potatoes Cooperatives	Agriculture (Sweet potatoes)	Cassim Echesa	0768969199	Lusheya Lubinu

16.	Kenya Agriculture and Livestock Research Organization (KALRO)	Research			Sub County
17.	Sub County Administrator	Sub County Administration (Coordination)	Joseph Muchuma Andeka	07222791970	Sub County
18.	Agriculture Sector Development Support program 9ASDSP)	Agriculture (Maize)	Catherine Mulwale	0716796001	Sub County
19.	National Government (DCC)	Sub County Administration (Security)	Mr. Munari	0724367402	Shinyalu Sub County.
20.	ASDSP	Agriculture	Albert Ochenje	0712824130	All 6 Wards
21.	KCSAP	Agriculture	Merinaadhiaya	0723798401	All 6 Wards
22.	ABDP	Agriculture	Norman Munala		5 Wards Absent in Isukha East
23.	KeLCoP	Agriculture	Frandina Machwenu	0710134417	Isukha Central
24.	Shibuye CBO	Agriculture	Violet Shibutse	0724233930	Shinyalu Sub County
25.	CFA/MUILESHI	Agriculture	Joseph Mbayi	0722481772	Shinyalu Sub County
26.	GFA/GIZ	Agriculture	Leah	0727580621	Shinyalu Sub County
27.	Appolo Agriculture	Agriculture	Winston Emulimi	0724023756	Shinyalu Sub County
28.	USAID 4 the child	Agriculture	Daisy Nunda	0728993286	Murhanda
29.	USAID Nuru ya mtoto project	Health/Agri	Mary Gerry	0719716633	Shinyalu Sub County
30.	Murhanda Farmers COOP	Agriculture	Collins Kimani	0707828277	Murhanda
31.	KTDA	Agriculture	Sore	070720616753	All 6 Wards
32.	KDDC	Agriculture	Joina Wabuyabo	0712566011	All 6 Wards
33.	CABDA	AGRIC/HEALTH	Joshua Kiberenge	0728407987	Murhanda
34.	Muliru Farmers Group (OCCIMUM GRP)	Agriculture	James Ligare Lilian	0728738630 0727210121	Isukha Central
35.	Black Soldier Fly Group	Agriculture	Peter Magori	0727118839	Isukha North
36.	Jomo Kenyatta University	Agriculture	Joyce	0721312776	Isukha North
37.	Mukango fish farmers group	Agriculture	Boaz Witaba	0721467454	Isukha Central
38.	Handed Fish Farmers Group	Agriculture	Clay Lukulu Chairman	0722522896	Isukha North
39.	Shibuye Fish Farmers	Agriculture	Fredrick Muchesia	0720468588	Isukha Central
40.	Shinyalu PAG pastors SACCO	Agriculture	Felistus Matunda	0729711022	Isukha Central
41.	Bukhungu WRUA	Agriculture	Shadrack Yakhama	0727424308	Isukha West
42.	Isiukhu WRUA	Agriculture	Paul Agoi	0722504758	Murhanda/Isukhaeast/North
43.	Youth for Heart connect CBO	Agric/health	Marvin Madegwa	0712548550	Isukha Central

44.	Nyayo Tea zone Isecheno Tea Block	Agriculture	Dan Chelule	0721431584	Isukha Central
45.	Shinyalu Tea Farmers Group	Agriculture	Abraham Bulinda	0724889850	Murhanda
46.	Shinyalu Tea Farmers Union	Agriculture	Hudson Inganji	0722562592	Shinyalu Sub County
47.	Tea Director	Agriculture	Abung'ana	0721603212	Shinyalu Sub County
48.	Agro Chemicals Association Of Kenya	Agriculture	Seth	0708791053	Shinyalu Sub County
49.	Mugombera Farmers	Agriculture	Dan Muchesia	0746101303	Isukha Central
50.	Practical Action	Agriculture	Monica Rapando	0710202625	Shinyalu Sub County
51.	Cereal Growers Association	Agriculture	Monica Rapando	0710202625	Shinyalu Sub County
52.	Ads	Agriculture	John Ashitiva	0724240093	
53.	Isukha Ivugwi Coffee Farmers Coop	Agriculture	Otiende	0727637677	Isukha East
54.	Kambiri Farmers Coop	Agriculture	Jackel Shivanda	0722345355	Isukha North
55.	One Acre Fund	Agriculture	Job	0726352486	6 Wards
56.	Murhanda Maize Farmers Group	Agriculture	Laura Musimbi	0720270935	Murhanda
57.	Mavuno Women Maize Farmers Group	Agriculture	Margaret Aketch	07759909165	Murhanda
58.	Baraka Women Group Kambiri	Agriculture	Florence Simiyu Matekwa	0727946967	Isukha North
59.	Kakamega Honey Keepers	Agriculture	Nicksonashiono	0714134614	Isukha North
60.	Isukha Central Maize producers Group	Agriculture	Truphenamueni	0726002130	Isukha Central
61.	Khayega Maize producers Group	Agriculture	Bonny Musindi Everline Atieno	0724262913 0742521825	Isukha South
62.	Isukha West Maize producers Group	Agriculture	Patrick Mmanyisi	0712247394	Isukha West
63.	KeLcOP farmers grp	Agriculture	Peter Bisau	0723784379	Isukha Central
64.	Biovision Trust	Agriculture	Pamela Elias	0726308569 0726086060	Shinyalu Sub County
65.	Fanisi fertilizer	Agriculture	Juliet	0712540874	Shinyalu Sub County
66.	West Kenya	Agriculture	John Kweyu Murunga	0702973052 0720952092	Shinyalu Sub County
67.	Ripple Effect	Agriculture	Isaac Ogutu	0724818944	Murhanda
68.	Shinyalu women SACCO	Agriculture	Petronillabusiega	0725933760	Isukha Central
69.	Jijenge Youth Group	Agriculture	Abraham Inguta	0740664077	Isukha North
70.	Umoja Youth Group	Agriculture	Dennis Muchesia		Murhanda
71.	Mwangaza CBO	Agri/S/Cane	Kadilo	0718485529	Shinyalu

72.	Macadamia/Avocado group	Agriculture	Gabriel Muteshi	0720816516	Isukha South
73.	Enso impact organization	showcasing their technologies on use of improved jikos.			
74.	GIZ	Energy conservation			Isukha South And Malava Sub- County.
75.	FIPS Africa				
76.	NETFUND	AGRI/MEDICINAL PLANTS	Cynthia	0716333648	Isukha Central
77.	Youth	Agriculture	Nevada Shiramba	0720459245	Isukha Central
78.	New Era Farmers Grp	Agriculture	Jackyline Centrinbisau	0716024733 0719880356	Isukha Central
79.	Agribora	Agriculture	Edgar Wanguba	0701132515	
80.	SLM/SFM INNOVATION PLATFORM	Agriculture	Protus Namunyu	0721582567	Murhanda
81.	Western seed	Agriculture	Joel Bania	0729582375	All Wards
82.	Homa lime company	Agriculture	Andati Getrine	0742340988	Isukha West
83.	Lean farm	Agriculture/livestock	Ann Omuruli	0721545222	Isukha West
84.	West kenya	Agriculture	Francis	0725442934	All Wards
85.	Rua	Water conservation	Chesire	0723058228	Murhanda
86.	Agri seed co	Agriculture	Timothy Wafula	0726109018	Shinyalu Sub County
87.	Nature Kenya	AgricS	Dorothy	0727956744	Murhanda
88.	Yara fertilizer	Agriculture	Eunice	0706159119	Shinyalu Sub County
89.	Pannar seed	Agriculture	Patrick Fwesa	0724035230	Shinyalu Sub County
90.	Sunculture	Agric irrigation	Kenneth Otieno	0790193321	Isukha Central
91.	Kenya seed	Agriculture	Felix	0724388296	Malava Sub-County
92.	One acre fund	Farm inputs	Purity Chebet	0707447847	Malava Sub-County
93.	Cereal growers association (C.G.A)	Agriculture	Brian Etemesi	0720057546	Malava Sub-County
94.	Agrochemicals association of Kenya (AAK)	Agriculture/livestock	Seth Adiedo	0708791033	Malava Sub-County
95.	KSAP	Agriculture	Merina Adhiaya	0723798401	Malava Sub-County
96.	A S D S P	Agriculture	Albert Ochenje	0712824130	Malava Sub-County
97.	USAID FOR THE CHILD	Health/agriculture	Daisy Nunda	0728993286	Malava Sub-County
98.	A D S	Agriculture	Florence	0725882933	Malava Sub-County
99.	KENAF	Agriculture	Habakkuk Khamala	0720833431	Malava Sub-County
100.	USAID SAVE CHILD	Agriculture	Cathrine Moraira	0720320773	Malava Sub-County

101.	Livestock Production department	Livestock	Caroline	0720650398	Malava Sub-County
102.	Fisheries department	Fisheries	Wilson Opalo	0721215201	Malava Sub-County
103.	Irrigation department	Irrigation	Masai Patrick	0718388827	Malava Sub-County
104.	Kenya forest services (KFS)	Forests	Rodah Ombwara	0726304215	Malava Sub-County
105.	KALRO	Research	Beatrice	0791443066	Malava Sub-County
106.	MMUST	Livestock	0721267359	0721267359	Malava Sub-County
107.	Butali sugar company	Sugar cane	Chivui	0713316656	Malava Sub-County
108.	West Kenya sugar company	Sugarcane	Shinachi	0728727626	Malava Sub-County
109.	Apollo Agriculture	Farm inputs			Malava Sub-County
110.	Water department	Water	Kephas Olwal	0729456619	Malava Sub-County
111.	One Acre Fund	Agriculture	Lilian Avugwi	0704854502	Lugari Sub-County
112.	Kenya Seed Company	Seed	Stephanie Chepkok	0728651250	Lugari Sub-County
113.	Panner Seed Company	Seed	Fulingi Fwesa	0724035230	Lugari Sub-County
114.	Baharini Irrigation Intergrated Horticultural S H G	Horticulture	Elias Savai	0721431455	Chekalini
115.	WRUA	Water	Nicholus Mugaizi	0728354570	Lumakanda
116.	Real IPM	Agriculture	John Katila	0727790024	Lugari Sub-County
117.	Star Rays	Organic Farmer	Makechi William	0721245443	Lugari Sub-County
118.	Agro Z	Storage	Peter Sachida	0710972330	Lugari Sub-County
119.	Yara Fertilizer Ltd	Fertilizers	Erick	0719251968	Lugari Sub-County
120.	`Farm Star	Fertilier	Gibson Kibeti	0708657200	Lugari Sub-County
121.	CGA	Environment	James Oduor	**0725902976**	Lugari Sub-County
122.	ADS	Environment/Agri Nutrition	Edwina Okoth	0713644274	Chekalini
123.	**FIPS AFRICA**	Agriculture & Conservation Agriculture	**Henry**	**0793268605**	Lugari Sub-County
124.	Irrigation Department	Irrigation	Zadock Ochami	0718119795	Lugari Sub-County
125.	Livestock Department	Livestock Production	Mr. Nyaundi James	0740840804	Lugari Sub-County
126.	Water Department	Water	Mr. Omenda		Lugari Sub-County
127.	Kenya Forest Services	Forestry	Nelson Misiko	0720625622	Lugari Sub-County
128.	Agriculture Department	Agriculture	Kakai W Kitui	0723109088	Lugari Sub-County
129.	Olivado Ltd	Avovado	Joseph Saidi	0794626638	Lugari Sub-County
130.	Equatorial Hortfresh Ltd	Horticulture	Antony Kirwa	0725650983	Lugari Sub-County
131.	AAK	Agro Chemicals	Jotham	0708791053	Lugari Sub-County
132.	Majengo Warehouse C S	Cereals Marketing	Elkah Adagi	0721205492	Lugari Sub-County
133.	KCEP	Cereals	Dr.Caro Kamau	0713170946	Lugari Sub-County
134.	KCSAP	Irrigation	Wilson Navagwi	0721353251	Chekalini

135.	ASDSP	Coordination	Albert Ochenje	0712824130	Lugari Sub-County
136.	Ripple Effect	Livestock Feed Production	Silas Wekesa	0713241183	Lugari Sub-County
137.	KMD	Meteorology	Vincent Sakwa	0722525902	Lugari Sub-County
138.	AGMARK		Geoffrey Wawire	0725395484	Lugari Sub-County
139.	GIZ	Carbon project	Ruth Wamukoya	0714661609	Etenje
140.	ADS Western	Sweet potatoes Production	Florence Omutimba	0725882933	Etenje
141.	ABED Self-Help Group	Indigenous Vegetables and Fish Farming	Author Atsiayo	0706063435	Etenje
142.	Zion Miracle Widows Group	Maize, Indigenous Vegetables and sweet potatoes Production	Monica Makokha	0721995688	Etenje
143.	CALEMBO	Faith Based Organization	Rajab Ondwasi	0725318913	Mumias North
144.	Ichinga Maize Value Chain	Indigenous/Local producers' group	Sarah Rashid	0728501946	Mumias North
145.	Bumanyi OVC	Community Based Organisation	Zainab Malala	0712190891	Mumias North
146.	Shiangusi Youth Group	Youth group	Suleiman Shikolio	0723692880	Mumias North
147.	Kalima	CBO	Ali Chitechi	0739194900	Mumias North
148.	Muslim Community	Spiritual Leader	Ismael Ngati	0717041066	Mumias North
149.	Waljak Cooperative	Finger millet production	Alpha's Ochura	0721369297	Musanda
150.	National Trust		Grace	0727321755	Musanda
151.	Seed Savers	Seed multiplier	Mercy Ambani	0718372360	Musanda
152.	USAID 4the child		Carren	0721220884	Musanda
153.	Musanda maize value chain	CBO	Hannington Wangaya	0725764511	Misanda
154.	ADS	Sweet potato production	Margret Kumbe	0716955753	Mumias Central
155.	Lureko disability SHG	PVD	Joseph Mukoya	0715341010	Mumias Central
156.	Maendeleo Ya Wanawake W/G	CBO-Indigenous/local vegetable .and sweet potatoes production.	Rose Kahunda.	0790006683	Mumias Central
157.	Elima Vision and Credit Sacco	BUSINESS			Mumias Central
158.	Table banking		Margaret kumbe	071695753	Mumias Central
159.	Galilea Group	Faith based	Pamela Onudi	070082008	Mumias Central
160.	SSP	Pest control	Issah Akello	0700833350	Mumias Central
161.	Shibale jua kali SHG	CBO	Amos Adhiambo	0799473730	Mumias Central

162.	Community leaders	Security control	Protus Sakwa. Mohammed.Munyira Cristine Ngome. Halima Mukabane Christine. Wanga James Kundu Medina. Chibayi Ali Shisia Mariamu Nyarotso	0727220692. 0724879339. 0728126793. 0729094635. 0723242161 0729915318 0758973918 0707981125 0790390776.	Mumias Central
163.	Khungema youth/G	Sweet potato production/value addition.	Dedan Kumbe	0769372691	Khungema Youth/G
164.	Nabongo AFS	Fish farming	James Netia	0705448086	Nabongo AFS
165.	GIZ/GFA	Agriculture	Faith	0718340894	Butsotso South
166.	KCSAP	Agriculture	Merina Adhiaya	0723798401	Butsotso East Butsotso Central
167.	ASDSP	Agriculture	Tobias Ochenje	0721316607	Across The Subcounty
168.	ADS	Agriculture	John Ashitiva	0724240093	Butsotso South, Butsotso Central, Mahiakalo, Shieywe Wards
169.	PRACTICAL ACTION	Agriculture	Monica Rapando	0710202625	Lurambi Sub-County
170.	CABDA	Agriculture/Health	Felix Osiel	0726301535	Butsotso Central, Shieywe
171.	REAL IPM	Agriculture	John Katila	0727790024	Butsotso Central And Butsotso Central
172.	BvAT(Biovision)	Agriculture	Biwort	0726086060	Mahiakalo, Shieywe
173.	USAID Advancing Nutrition	Health	Catherine Moraira		Lurambi Sub-County
174.	Shibuye CBO	Agriculture	Violet Shivutse	0724233930	Butsotso South
175.	ABDP	Agriculture	Munala Norman	0722993334	Butsotso South, Shiywe
176.	Indombera Cbo	Agriculture	Mary Mulosia	0726117489	Butsotso South
177.	Emukaya Top Joy Farmers	Agriculture	Janefavour Nechesa	0716039421	Butsotso South
178.	Baraka Youth	Agriculture	Patterson Igata	0729457895	Mahiakalo
179.	Ukweli SHG	Agriculture	Asnate Mudanya	0712325550	Mahiakalo
180.	Tuinuke Shibuli	Agriculture	Mary Kalerwa	0720278452	Butsotso Central
181.	Ashiswa Youth Group	Agriculture	Boaz Were	0701636442	Butsotso Central
182.	Amka Twende Wg	Agriculture	Felistus Mulari	0710291588	Butsotso Central
183.	Fariji Women Group	Agriculture	Ann	0725159851	Butsotso Central
184.	Censo Motorbike Self Help Group	Agriculture	Milton Ambundo	0728679782	Butsotso Central
185.	Munzeywe CBO GROUP	Agriculture	Zablon Malenge	0724039077	Butsotso Central

186.	Indangasia Micro Catchment Community Development Driven Group	Agriculture	Astarico Musundi	0757918561	Butsotso East
187.	Jisimamie CBO	Agriculture	Cyrus Akhonya	0721102508	Butsotso East
188.	Livingstone Youth Group	Agriculture	Siziane	0703591713	Butsotso East
189.	Matimboli Women Group	Agriculture	Mmboshi	0722739422	Butsotso East
190.	Elwanda Self Group	Agriculture	Mark Mukanzi	0711516682	Butsotso East
191.	Wakwetu Women Group	Agriculture	Alma Canute	0721838390	Shieywe
192.	Just for Us Family of Grace(JUFOC)	Agriculture	James Bunyali Brown	0720475892	Shieywe
193.	Shichirayi Community health workers group (CHV,S)	Agriculture	Linet Lubanga	0729601793	Shieywe
194.	Shirere Maize Producer Group	Agriculture	John Oloo	0720815717	Shirere
195.	One Acre Fund	Agriculture			Likuyani Sub-County
196.	Kenya Seed Company	Seed	Stephanie Chepkok	0728651250	Likuyani Sub-County
197.	Panner Seed Company	Seed			Likuyani Sub-County
198.	Likuyani Horticultural Cooperative Society	Fruits	Henry Kadima	0725769849	Likuyani Sub-County
199.	Little Nzoia WRUA	Water	Wycliffe Kisingula	0722755313	Sango
200.	REAL IPM	Fertilizer	John Katila	0727790024	Sango /Likuyani
201.	Star Rays	Public Health	Stellah Makari	0724549352	Kongoni/Likuyani
202.	AGRO Z	Storage	Peter Sachida	0710972330	Likuyani Sub-County
203.	Chironmo Fertilizer Ltd	Fertilizers	Anne Wambeo	0728711580	Likuyani Sub-County
204.	`Farm Star	Fertilizer	Benson Ngaire	0725514115	Subcounty
205.	**K**uza Mazingira Yetu Consortia	Environment	**An**drea Ogada	**07**05344875	Nzoia
206.	Msemwa Farm Produce Tree Nursery	Environment	Patrick Inziani	0710910645	Nzoia
207.	Nzoia Water Resource Users	Water	Ernest Morani	0725546624	Nzoia
208.	Linrwa Conservation Shg	Soil And Water	Susan Cherubet	0713797695	Sango
209.	Lugulu Community Dam Shg	Water/Environment	Ernest Imo Omoke	0743633411	Sango
210.	Linrua Afs Shg	Water	Mercyline Nambuye	0708248174	Sango
211.	Soy Focal Area Development Committee	Agriculture/Environment	Nahasion Ong'ole	0725868397	Likuyani Sub-County
212.	Likuyani Maize Enterprise Group	Agriculture	Meshack Sifumbukho	0720870680	Likuyani Sub-County
213.	Irrigation Department	Irrigation	Zadock Ochami	0718119795	Likuyani Sub-County
214.	Livestock Department	Livestock Production	Mr.Shamalah	0725536700	Likuyani Sub-County
215.	Water Department	Water	Mr. Omenda		Likuyani Sub-County

216.	Kenya Forest Services	Forestry			Likuyani Sub-County
217.	Agriculture Department	Agriculture	Fredrick Chimwani	0786906794	Likuyani Sub-County
218.	Biofarms ltd	Avovado	Robert Mahanu	0714688208	Likuyani Sub-County
219.	Equatorial Hortfresh Ltd		Antony Kirwa		Likuyani Sub-County
220.	Kalro-Hri ,Kandara	Passion Fruit	Simon Wepukhulu	0722663729	Likuyani Sub-County
221.	Lukanama	Cereals Marketing	Stephen Muliuli	0724603622	Kongoni
222.	KCEP	Cereals	Dr. Caro Kamau	0713170946	Likuyani Sub-County
223.	KCSAP				Sinoko/Nzoia
224.	ASDSP		Dr. Catharine Mulwale		
225.	RIPPLE EFFECT	LIVESTOCK FEED PRODUCTION	Silas Wekesa	0713241183	Likuyani Sub-County
226.	RSP		Everlyne Odongo	0716799261	Likuyani Sub-County
227.	KMD	METEOROLOGY	Vincent Sakwa	0722525902	Kongoni
228.	AGMARK		Geoffrey Wawire	0725395484	Likuyani Sub-County
229.	Homa lime company	Agriculture	Andati Getrine	0742340988	Isukha West
230.	Lean farm	Agriculture/livestock	Ann Omuruli	0721545222	Isukha West
231.	Fanisi fertilizer	Agriculture	Juliet	0712540874	
232.	ADS	Agriculture	John Ashitiva	0724240093	
233.	Western seed	Agriculture	Joel Bania	0729582375	
234.	ASDSP	Agriculture	Albert Ochenje	0712824130	Shinyalu Sub-County
235.	KCSAP	Agriculture	Merina Adhiaya	0723798401	Shinyalu Sub-County
236.	ABDP	Agriculture	Norman Munala		5 Wards Absent in Isukha East
237.	KeLCoP	Agriculture	Frandina Machwenu	0710134417	Isukha Central
238.	Shibuye chw	Agriculture	Violet Shibutse	0724233930	Shinyalu Sub-County
239.	CFA/MUILESHI	Agriculture	Joseph Mbayi	0722481772	Shinyalu Sub-County
240.	GFA/GIZ	Agriculture	Leah	0727580621	Shinyalu Sub-County
241.	Appolo Agriculture	Agriculture	Winstone Mulimi	0724023756	Shinyalu Sub-County
242.	USAID 4 the child	Agriculture	Daisy Nunda	0728993286	Murhanda
243.	USAID Nuru ya mtoto project	Health/Agri	Mary Gerry	0719716633	Shinyalu Sub-County
244.	Murhanda farmers COOP	Agriculture	Collins Kimani	0707828277	Murhanda
245.	KTDA	Agriculture	Sore	070720616753	Shinyalu Sub-County
246.	KDDC	Agriculture	Joina Wabuyabo	0712566011	Shinyalu Sub-County
247.	CABDA	Agriculture /HEALTH	Joshua Kiberenge	0728407987	Murhanda
248.	Muliru Farmers Group (OCCIMUM GRP)	Agriculture	James Ligare Lilian	0728738630 0727210121	Isukha Central
249.	Black Soldier Fly Group	Agriculture	Peter Magori	0727118839	Isukha North
250.	Jomo Kenyatta University	Agriculture	Joyce	0721312776	Isukha North
251.	Mukango fish farmers group	Agriculture	Boaz Witaba	0721467454	Isukha Central

252.	Handed fish farmers group	Agriculture	Clay Lukulu Chairman	0722522896	Isukha North
253.	Shibuye fish farmers	Agriculture	Fredrick Muchesia	0720468588	Isukha Central
254.	Shinyalu PAG pastors SACCO	Agriculture	Felistus Matunda	0729711022	Isukha Central
255.	Bukhungu WRUA	Agriculture	Shadrack Yakhama	0727424308	Isukha West
256.	Isiukhu WRUA	Agriculture	Paul Agoi	0722504758	Murhanda /Isukha East/North
257.	Youth for Heart connect CBO	Agriculture /health	Marvin Madegwa	0712548550	Isukha Central
258.	Nyayo tea zone Isecheno tea block	Agriculture	Dan Chelule	0721431584	Isukha Central
259.	Shinyalu tea farmers group	Agriculture	Abraham Bulinda	0724889850	Murhanda
260.	Shinyalu tea farmers union	Agriculture	Hudson Inganji	0722562592	Shinyalu Sub-County
261.	Tea director	Agriculture	Abung'ana	0721603212	Shinyalu Sub-County
262.	Agro chemicals association of Kenya	Agriculture	Seth	0708791053	Shinyalu Sub-County
263.	Mugombera Farmers	Agriculture	Dan Muchesia	0746101303	Isukha Central
264.	Practical action	Agriculture	Monica Rapando	0710202625	Shinyalu Sub-County
265.	Cereal growers Association	Agriculture	Monica Rapando	0710202625	Shinyalu Sub-County
266.	ADS	Agriculture	John Ashitiva	0724240093	
267.	Isukha Ivugwi Coffee Farmers Coop	Agriculture	Otiende	0727637677	Isukha East
268.	Kambiri Farmers Coop	Agriculture	Jackel Shivanda	0722345355	Isukha North
269.	One Acre Fund	Agriculture	Job	0726352486	6 Wards
270.	Murhanda Maize Farmers Group	Agriculture	Laura Musimbi	0720270935	Murhanda
271.	Mavuno Women Maize Farmers Group	Agriculture	Margaret Aketch	07759909165	Murhanda
272.	Baraka Women Group Kambiri	Agriculture	Florence Simiyu Matekwa	0727946967	Isukha North
273.	Kakamega Honey Keepers	Agriculture	Nickson Ashiono	0714134614	Isukha North
274.	Isukha Central Maize producers Group	Agriculture	Truphena Mueni	0726002130	Isukha Central
275.	Khayega Maize producers Group	Agriculture	Bonny Musindi Everline Atieno	0724262913 0742521825	Isukha South
276.	Isukha West Maize producers Group	Agriculture	Patrick Mmanyisi	0712247394	Isukha West
277.	KeLcOP farmers grp	Agriculture	Peter Bisau	0723784379	Isukha Central
278.	Biovision Trust	Agriculture	Pamela Elias	0726308569 0726086060	All

279.	Fanisi fertilizer	Agriculture	Juliet	0712540874	All
280.	West Kenya	Agriculture	John Kweyu Murunga	0702973052 0720952092	All
281.	Ripple Effect	Agriculture	Isaac Ogutu	0724818944	Murhanda
282.	Shinyalu women SACCO	Agriculture	Petronilla Busiega	0725933760	Isukha Central
283.	Jijenge Youth Group	Agriculture	Abraham Inguta	0740664077	Isukha North
284.	Umoja Youth Group	Agriculture	Dennis Muchesia		Murhanda
285.	Mwangaza CBO	Agriculture	Kadilo	0718485529	Shinyalu
286.	Macadamia/Avocado group	Agriculture	Gabriel Muteshi	0720816516	Isukha South
287.	FIPS Africa				
288.	NETFUND	AGRI/MEDICINAL PLANTS	Cynthia	0716333648	Isukha Central
289.	Youth	Agri	Nevada Shiramba	0720459245	Isukha Central
290.	New Era Farmers Grp	Agri	Jackyline Centrin Bisau	0716024733 0719880356	Isukha Central
291.	Agribora	Agri	Edgar Wanguba	0701132515	
292.	SLM/SFM INNOVATION PLATFORM	AGRI	Protus Namunyu	0721582567	Murhanda
293.	GIZ GFA	Agriculture	Leah Munala	0727580621	Marama South
294.	GIZ Welthunger	Agriculture	George	0724369809	Marama Central
295.	UNDP	Agriculture	Zablon Indakwa	0790885111	Marama Central
296.	Anglican Development Service (ADS)	Agriculture	Florence	0725882933	Marama West
297.	One Acre Fund	Agriculture		0781884779	All Wards
298.	Agriculture Sector Development Support Program (ASDSP)	Agriculture	Albert Ochenje	0712824130	All Wards
299.	Kenya Climate Smart Agriculture Project (KCSAP)	Agriculture	Merina Adhiaya	0723798401	Marama West
300.	Farm inputs promotion Africa (FIPS Africa)	Agriculture	Martin	0110895980	All Wards

ANNEX 2: WATER, ENVIRONMENT, NATURAL RESOURCES AND CLIMATE CHANGE STAKEHOLDERS

	Contact Person	Name of Organization	Position	PHONE NUMBER	Email Address	Areas of intervention
	Hezbon Abong	USAID WKWP	WASH Governance specialist	`0723934405	hezbon_abong@dai.com	provision of safe water, water Resource management and climate change
1	Washington Ogutu	Shanta Gold Kenya Limited	Section Leader-Sustainability: Community, Government, Environment	`0721438704	WOuga@acaciamining.com	gold exploration, access to clean water
2	David Kiplagat Mutai	Water Resources Authority (WRA)	Regional Manager	`0724106328		water resource management; information collection, dissemination and storage on water resources, analyses, stores.
3	Florence Korir	World Vision	Manager World Vision Matete ADP	`0723015999	Florence Korir@wvi.org	water, food security, climate change
4	Euphresia Musundi	Kenya Red Cross Society	Regional Coordinator-Kakamega	`0711927217	euphresiamusundi@gmail.com	water, food security, climate change
5	Edwin Omondi	One Acre Fund	Liason person	`0721907769	edwine.omondi@oneacrefund.org	food security, climate change,
6	Alice Anyona	Kenya Forest Services (KFS)	Forest Officer-Lurambi Sub County	`0721870988	alice_anyona@yahoo.com	forest management
7	John Sikanga Maniafu	NEMA-Kakamega	Kakamega County Director	`0724430437	cdekakamega@gmail.com	environmental coordination
8	Vincent Sakwa	Kenya Meteorological Department	County Director	`0722525902	sakwa_v@yahoo.uk	climate information

9	Joel Ouma	Evidence Action	Coordinator	723704400	joel.ouma@evidenceaction.org	climate change,
10	Brendah Ayugi	Wildlife Clubs of Kenya(WCK)	Coordinator	`0710388991	breshede@gmail.com	awareness on biodibversity conservation
11	Rael Adhiambo	NACOSTI	Analyst, Earth and Space Sciences Schedule	`0710958665	rael.adhiambo@nacosti.go.ke	Access to Benefit Sharing on biological and genetic resources
12	Humprey Agevi	Masinde Muliro University of Science & technology	Lecturer, Department of Biological Sciences	`0720175880	hagevi@mmust.ac.ke	Research and renovation
13	Jael Amati	Groots Kenya Limited	Programme Officer	`0720778763	jael.amati@gmail.com	
14	Gilfine Nyangasi	Ecolibrium	Manager	`0715885925	info@solibrium-solar.com	clean energy
15	Dr Leila Ndalilo	KEFRI-KAKAMEGA	Incharge	`0725887938		research and development
16	Grace Kariuki	KWS	Warden	`0721854365	gkariuki@kws.go.ke	wildlife management
17	Samuel Akollo	ADS-Agriculture	Programmes Manager Food Security Project	`0716426654	akollosamuel@gmail.com	climate change, food security
18	Arnold Ambei	CJPC-KAKAMEGA	Diocesan Programs Officer	`0710732504	cjpckakamegadiocese@gmail.com	climate change, agriculture, advocacy, human rights, women empowerment
19	Paul Lumadi	Kakamega Natural Forest Community Conservation Organization	Chairman	`0721329061	paulburudilumadi@gmail.com	environmental conservation
20	Bernard Masiga	Sinoko Ward Community Association-Likuyani	Chairman	`0722720330	ambernard@gmail.com	water management
21	Leonard Muhanga	Nature Kenya	project extension officer	`0724202393	mlikhotio@gmail.com	natural resource management

22	Stella Wanjala	Women in Natural Resource conservation	Director	`0725216292	womeninwaterandconsevation@gmail.com	women empowerment, food security
23	Maria Imali	Rising to Greatness Organization(Youth group in Mining)	Project Cordinator	`0740126429	risingtogreatn2019@gmail.com;imalimaria@gmail.com	sensitization of artisanal miners on safe mining, environmental conservation and women and youth empowerment
24	Maurice Wanyiri	Kenya Forest Service (KFS)	Ecosystem Conservator	0715682728	zmkakamega@kenyaforestservice.org	forest management
25	Timothy Mukoshi	Gold Artisanal Miners	Chairman	0703961468		safe mining, land rehabilitation
26	Silvanus Omurunga	Misango Hills CFA	Chairman	0721467650	mishicofa@gmail.com	conservation
27	Moses Wesuzwa	Radio Ingo	Presenter	0726285515		environmental awareness and information dissemination
28	Dr. Stephen Okinyi	Agakhan Hospital kakamega	OHC In Charge	0722567996	okinyi.stephen@akhskenya.org	health environmental conservation, public health
29	Samuel Too	Regional Mining Office-Kakamega	Regional Mining Officer	0721939713	kipla.too@gmail.com	coordination of mining activities
30	Jane Atulo	Eco2librium	Senior Manager, Operations & Human Resource	0746284386	jane.atulo@eco2librium.com	clean energy
31	George Murila	Kakamega Natural Forest Community Conservation Organization	Chief Executive Officer	0722 854 614	info@Kakamegaforest.org	forest rehabilitation, environmental awareness
32	Flora Ajwera	GIZ	Senior Soil Advisor	0724480749	flora.ajwera@giz.de	environmental conservation, agriculture,
33	Charles Oliya	Kenya Scouts Association-Kakamega	County Scouts Commissioner	0722942433		environmental conservation; biodiversity conservation
34	Nelson Nyongesa	Lugari Wildlife Sanctuary	Chairman	722689559	nelsonnyongesa@gmail.com	water resource management, clean water provision
Community Forest Associations-water resource management, clean water provision						

1	Joseph Mbai	MUILESHI CFA	Chairman	`0722481572/0733449440	mbaijoseph60@gmail.com	innovation in water pumping, supply and management
2	Wilfred Mulindi	Nzoia	Chairman	`0726411083	-	forest management
3	joseph Sakwa	Malava Macheto	Chairman	`0725751551	-	forest management
4	Francis Iseru	Lugari CFA	Chairman	`0723865035	-	forest management
5	Samwel Imbwaga	Turbo	Chairman	`0712602448	-	forest management
6	Patrick Erima	Bunyala Nasina	Chairman	`0726495708	patrickerima7@gmail.com	forest management
					-	
	Water Resource Users Association					
1	Moses Andika	WRUA-Lubao Sasala	Chairman	0717453026	wamanyasy@gmail.com	water resource management
2	Henry Moi	WRUA- Yala	Chairman	0710797510		water resource management
3	Abdi Libuyi	Lusumu WRUA	Chairman	`0721138519; 073229	abdilibuyi@gmail.com	water resource management
4	Livingstone Wetende	Munasi-Navakholo	Chairman	`0727766402	-	water resource management
5	Herbert Luso	Mumias	Chairman	0720716074/0722 5288253		water resource management
6	Paul Agoi Shikunzi	Isiukhu	Chairman	`0722504758	paulagoi46@gmail.com	water resource management
7	Shadrack Yakhama	Bukhungu/Lower Isiukhu	Chairman	`0727424308		water resource management
8	joseph Many	upper Lubao/Sasala	Chairman	`0724276047	josephmanyogollah@gmail.com	water resource management
9	Wycliffe Mmboku Kisingula	lower Little Nzoia	Chairman	`0722755313	kisingula@gmail.com	water resource management
10	Nicholas Mukayisi	Murugusi	Chairman	0728354570/0724 179669		water resource management
11	Francis	Tande Nambilima	Chairman	`0721348731		water resource management
12	Okwami	Mayoni	Chairman			water resource management
13	Kennedy Messo	Lower Kipkaren	Chairman	`0727278977	kennedymesso@yahoo.com	water resource management

14	Livingstone Wetende	Firatsi	Chairman	`0727766407/0735205789	firatsi10@gmail.com	water resource management
15	Onyango Cornel	Kisama-Sigomere	Chairman	`0720344634	cornelanyango@gmail.com	water resource management
16	Saulo	Yala Kimilongo	Chairman	`0721773174		water resource management
17	Florence K. Akumu	Sergoit WRUA	Chairman	`0703777624/`0727473466	sifuwanyama@gmail.com	water resource management
18	Sheikh Maalim	Kipsangui River	Chairman	`0710925989		water resource management
19	Moses Wamanyasi	Lower Sasala Lubao	Chairman	`0717453026	wamanyasy@gmail.com	water resource management
20	Maurice Wanyiri	Kenya Forest Service (KFS)	Ecosystem Conservator	0715682728	zmkakamega@kenyaforestservice.org	Forest management
21	Timothy Mukoshi	Gold Artisanal Miners	Chairman	0703961468		sustainable Gold mining
22	Silvanus Omurunga	Misango Hills CFA	Chairman	0721467650	mishicofa@gmail.com	Forest governance
23	Moses Wesuzwa	Radio Ingo	Presenter	0726285515		awareness and dissemination of information on environmental conservation
24	Dr. Stephen Okinyi	Agakhan Hospital kakamega	OHC In Charge	0722567996	okinyi.stephen@akhskenya.org	public health, environmental conservation
25	Samuel Too	Regional Mining Office-Kakamega	Regional Mining Officer	0721939713	kipla.too@gmail.com	coordination of mining activities
26	Jane Atulo	Eco2librium	Senior Manager, Operations & Human Resource	0746284386	jane.atulo@eco2librium.com	clean energy
27	George Murila	Kakamega Natural Forest Community Conservation Organization	Chief Executive Officer	0722 854 614	info@Kakamegaforest.org	forest rehabilitation and restoration
28	Flora Ajwera	GIZ	Senior Soil Advisor	0724480749	flora.ajwera@giz.de	agriculture, carbon trade and food security
29	Charles Oliya	Kenya Scouts Association-Kakamega	County Scouts Commissioner	0722942433		forest management

Annex 3: summary of identifies hazards at each Ward