MANDERA COUNTY GOVERNMENT

Participatory Climate Risk Assessment Report

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FOREWORD

It is with great pleasure that I introduce the Participatory Climate Risk Assessment (PCRA) report for Mandera County. This comprehensive and insightful document represents the collective efforts of numerous stakeholders, County Technical officers, and community members who have come together to assess the climate risks faced by the County.

In the last 30 years, Mandera County has experienced prolonged drought, flash floods during rainy seasons, outbreak of pest and diseases, conflicts over scarce natural resources and environmental degradation. These impacts have far-reaching consequences on water availability, Livestock and agricultural production, food security, human and animal health.

This report serves as a valuable resource for policymakers, planners, and individuals alike, providing critical insights into the climate risks specific to Mandera County. One of its standout features of this report is its participatory nature as it was developed through a ward level community consultations and multi-stakeholder collaborative workshop involving representatives from County Government sectoral department, National Government agencies, Development Partners, Private sector, Non-governmental Organizations, Faith Based Organization and Organizations representing Marginalized group.

The report provides a comprehensive overview of the climate risks and vulnerabilities present in Mandera County and examine key sectors such as Agriculture, Water resources, Energy, Environment and Natural resources, Disaster and livelihoods, shedding light on the impacts of climate change on each of these areas. Additionally, it offers a detailed analysis of current adaptation measures in place, highlighting both successes and areas for improvement.

Importantly, this report goes beyond simply identifying risks and offers a roadmap for action. It presents a set of recommendations that will guide in the development of the Mandera County Climate Change Action Plan (2023-2027).

As one of the requirements, this PCRA report will unlock the County Climate Resilience Investment (CCRI) Grants under the Financing Locally Led Climate Action (FLLoCA) Program funded by the World Bank through the National treasury.

I would like to express my sincere gratitude to everyone involved in the development of this report especially to the people of Mandera County for their active participation and invaluable contribution.

I encourage all readers to absorb the findings of the report and consider how we can collectively take meaningful action towards a future where the people of Mandera County are empowered to overcome climate risks and thrive in the face of adversity.

H.E Mohamed Adan Khalif

Governor

Mandera County.

ACKNOWLEDGEMENT

The success of the Participatory Climate Risk Assessment (PCRA) process in Mandera County was made possible through the generous support and guidance of various key stakeholders.

I am particularly grateful for the goodwill and guidance of the Governor, H.E Mohamed Adan Khalif, whose vision and commitment to addressing climate change challenges, played a pivotal role in the PCRA success.

I wish to acknowledge the individual efforts of the County Climate Change Technical Working Group (CCTWG) under the guidance of County chief officer for Environment and Climate Change. Special mention goes to the members of the County Climate Change Unit for their tireless efforts in coordinating the process.

I highly appreciate the World Food Program for their support in training the CCTWG and facilitating the community engagement and data collection.

I would like to express my deepest gratitude and appreciation to all individuals and organizations who contributed to the successful execution of the PCRA process. Your dedication, expertise, and collaborative efforts have been invaluable in advancing our understanding of climate risks and developing appropriate strategies for resilience.

Mohamed A. Omar

County Executive Committee Member

Water, Energy, Environment, Natural resources and Climate Change

EXECUTIVE SUMMARY

The County Participatory Climate Change Risk Assessment (PCRA) was undertaken between March and May 2023. The purpose of this PCRA is to provide the local communities with the opportunity to understand the climate change risks and hazards that affect them identify and prioritize appropriate interventions and draw community-driven action plan and adaptation strategies for addressing them. The PCRA further provide the Mandera County Government with critical information necessary for development of County Climate Change Action Plan, integration of climate issues into the CIDP and the National Climate Change Action Plan.

PCRA is also one of the conditions for accessing the Climate Resilience Investment Grant from the National Treasury's Financing Locally Led Climate Action, (FLLoCA). The PCRA report documents prevalent climate risks, sources of vulnerability and the prioritized adaptation response actions.

The process of conducting the PCRA process involved: Formation and training of the Technical Working Group, stakeholder's analysis and mapping, community engagements at ward level, collection of historical, current and projected data of local climatic patterns, socio-economic conditions and vulnerability analysis, conducting county level workshop on climate change risk assessment as well as final report writing.

The process involved active engagement with community members so as to understand the climate risks they face and develop appropriate strategies for building resilience. It employed a participatory approach, integrating local knowledge and scientific expertise to assess climate risks comprehensively.

Pastoralism is the economic mainstay contributing to approximately 72% of the total household income. Cross-border trade, beekeeping and irrigation-aided agriculture are the other viable ventures. Beekeeping is gaining popularity in most parts of the county, while irrigated subsistence agriculture is practiced along the Daua River. The common breeds of livestock reared in this county are goats, cattle, camels, sheep, donkeys and chickens

The assessment identified several climate risks affecting Mandera County. These include prolonged droughts leading to water scarcity, pests and diseases leading to loss of livestock and reduced agricultural productivity, Conflicts both human-human and human wildlife over the scarce resources and floods posing threats to infrastructure, livelihoods, and human safety. During the prolonged droughts grazing

fields are adversely affected leading to loss of pasture and eventually loss of livestock. Floods along river Daua during the rainy seasons have led to crop destruction leading to food insecurity in wards such as Neboi, khalalio and Rhamu. These devastating impacts have greatly affected the pastoralists, small holder farmers who heavily rely on natural resources without forgetting social groups such as women, Persons with disabilities and marginalized community known as the “corner tribe”.

Based on the assessment, key adaptation strategies recommended include: water resources management, which involves enhancing infrastructure for water storage and harvesting, training of WUAs on water resources management and sustainability and environmental conservation efforts such as afforestation programs. Additionally, promoting efficient irrigation practices and exploring alternative water sources like groundwater can help ensure water availability and security.

Another important strategy is the promotion of climate-smart agricultural practices. This entails encouraging the diversification of livelihoods and improving access to agricultural inputs, information, and markets. By adopting climate smart strategies that are resilient to climate change impacts, agricultural systems can become more adaptive and sustainable.

To enhance preparedness and timely response, strengthening early warning systems for droughts and floods is vital. By improving the detection and warning mechanisms, communities can be better equipped to respond effectively to climate-related hazards.

Livestock management is also crucial in building resilience. This involves promoting resilient livestock practices, such as breed improvement, disease control measures, and exploring alternative sources of fodder. These actions can help mitigate the impacts of climate risks on livestock and safeguard the livelihoods of pastoralist communities.

Addressing health risks related to climate change is another important aspect. Improving healthcare services, strengthening disease surveillance systems, and implementing climate-resilient sanitation measures are necessary steps to protect communities from climate-related health impacts.

Lastly, enhancing community awareness and capacity building is essential. This includes increasing community knowledge and understanding of climate risks, promoting adaptive practices, and strengthening local institutions. Empowering communities with the necessary knowledge and skills can foster their active participation in climate resilience initiatives.

TECHNICAL WORKING GROUP

S/NO.	NAME	DESIGNATION
1.	Issack A. Ali	County Director, Climate Change (Technical Coordinator)
2.	Basra Hussein	County Director, Energy, Environment and Natural Resources
3.	Abdirahman Maalim Hussein	Principal Environment officer
4.	Siyad Ahmed Maalim	Chief Environment Officer
5.	Adan Ahmed Omar	Senior Economist
6.	Samson Mulandi	Irrigation Engineer
7.	Mohamedweli Alinur	Assistant Director, Efficiency and Monitoring Unit
8.	Mustafa Sheikh Osman	Assistant director Devolved Unit
9.	Irshad Hussein Haji	Senior Superintendent Engineer
10.	Abdimalik Bishar Maalim	Special Programmes Officer
11.	Alio Hassan Kala	Agricultural extension officer
12.	Saadia Adan Mohamed	Assistant director, Department of Youth affairs
13.	Adan Ismail Sheikh	Veterinary Officer
14.	Ismail Mukhtar Adan	Forester, Kenya Forest Services
15.	Abdi Mohamed Haji	Program officer, Danish Refugee Council
16.	Sulekha Adow	Sub-County Health Administrator

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DEFINITION OF TERMS

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

LIST OF ACRONYMS AND ABBREVIATIONS

CCAP	Climate Change Action Plan
CCCF	County Climate Change Fund
CCD	Climate Change Directorate
CCU	Climate Change Unit
CIDP	County Integrated Development Plan
CSO	Civil Society Organizations
DRC	Danish Refugee Council
GIS	Geographical Information Systems
IGAD	Intergovernmental Authority on Development
KEMRI	Kenya Medical Research Institute
KFS	Kenya Forest Service
KMD	Kenya Meteorological Department
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Services
MOALF	Ministry of Agriculture, Livestock and Fisheries
NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
PCRA	Participatory Climate Risk Assessment
PLWDs	Persons Living with Disability
RACIDA	Rural Agency for Community Development and Assistance
SMEs	Small and Medium Enterprises
TWG	Technical Working Group
VOPA	Voice Of Peace for All In The Horn Of Africa
WFP	World Food Program
WRUAs	Water Resource Users Association

CHAPTER ONE: BACKGROUND AND CONTEXT

1.0 Background of Mandera County.

Mandera County is one of the 47 counties in Kenya that was established in March 2013 following the promulgation of the Constitution of Kenya, 2010. It borders Ethiopia to the North, Somalia to the East and Wajir County to the South-West. The county lies between latitudes 20 11` North, and 40 17` North, and longitudes 390 47` East and 410 4.8` East. It covers an area of 25,991.5km^2.

The 2019 Kenya Population and Housing Survey report (KPHC) showed that Mandera County had a population of 867,457 persons. This comprised 434,976 male (50.14%), and 432, 444 female (49.85%), and 37 intersexes.

Figure 1:Map of Kenya Showing the Location of Mandera County

Source: *Mandera County Integrated Development Plan (CIDP 2023-2027)*

The County is predominantly semi-arid, with most of the county receiving average annual rainfall of below 250 mm. The rainfall amounts range between 40mm and 250mm with a climate mean of 200mm. The long rains occur between March, April and May (MAM) and the short rains between October, November and December (OND). The driest periods in the county are January, February and September. The rainfall is erratic and normally results in flash floods and river floods virtually when normal to above normal rains is realized in the county.

Rainfall is scanty and unpredictable, averaging 191.7mm annually. The long rains fall in April and May averaging 69.1mm, while the short rains fall in October and November averaging 122mm Most parts of the county experience long hours (approximately 11 hours) of sunshine in a day. This causes high evaporation rates, leading to withering of most of the vegetation before they mature. The continuous sunshine in the county has great potential for harnessing solar energy.

Temperatures are high with a minimum of 24^{o}C in July and a maximum of 42^{o}C in February. Variation in altitude is the cause of differences in temperatures across the county, where places near Banisa Constituency experience low temperatures due to neighbouring highlands in Ethiopia

The surface runoff and potential evaporation rates are extremely high (CIDP 2013-2017). The seasonal rainfall distribution across the county is not both spatial and temporal evenly distributed in the entire county. Drought episodes in the county occur in every 3-5 years, though in recent years, the occurrence of back-to-back single year drought (Drought: when there is a completely failure of two consecutive rainfall seasons that's a drought situation) has increased due to impacts of climate change. The rainfall peaks in the county occur on the months of April, July and November during the main rainfall seasons as depicted above by figure on mean monthly rainfall distribution in the county

Despite the unfavourable climatic conditions, agriculture is the major livelihood in the county, employing over 90% of the population. Livestock production is the predominant sub-sector, employing over 84% of the population, and contributing approximately 72% to household incomes. The county is highly vulnerable to droughts, heat stress and moisture stress, hazards that affect the production, storage and sales of agricultural produce and livestock products. Flash floods also occur periodically, affecting both crop and livestock production including limiting access to inputs and markets for the sale of produce.

The adaptive capacity of the county's population is hampered by high poverty and illiteracy rates, adverse climatic conditions, poor road infrastructure, and outbreaks of livestock diseases, environmental degradation and insecurity

1.1.1 Socio-Economic development.

The main economic activity in Mandera County is pastoralism, contributing approximately to 72% of the total household income. Cross-border trade, beekeeping and irrigation-aided agriculture are the other viable ventures. Beekeeping is gaining popularity in most parts of the county, while irrigated subsistence agriculture is practiced along the Daua River.

The main food crops grown are maize, sorghum and cowpeas. Horticultural crops, i.e., vegetables (sukuma wiki, cow peas, onions, spinach, tomatoes) and fruits grown are onions, watermelons, capsicums, mangoes, bananas, kales and tomatoes. Simsim is also grown as an oil crop.

The acreage under food crops and cash crops is approximately 716.58 hectares. The main cash crops are horticultural and oil crops (Simsim, Sun flower and groundnuts). Kiliwehiri in Banisa Constituency; Rhamu and Guticha in Mandera North have potential for growing oil crops under irrigation. The average farm size ranges between 2.5 – 15 hectares and these are dominantly found along river Daua.

The common types of livestock reared are goats (galla breeds), cattle (boran breeds), camels Somali breeds), sheep (Somali black head breeds), donkeys (Somali breed) and chicken (indigenous breed).

The County has one seasonal river which is a source of water for many households in the County, especially in Mandera East and Mandera North Sub-counties. The County has 218 functional boreholes and 235 water pans serving 24,300 households that have access to piped water, with further 84,203 households having access to portable water. The County has two registered water services providers in Mandera and Elwak towns.

According to the 2018 Taskforce Report on Forest Resources Management and Logging Activities in Kenya, Mandera County has a forest cover of 3.04% which is below Kenya's estimated of 7.4%.

The main source of energy is firewood, used by 93.6% of the households for cooking (KNBS 2013), with Lafey, Mandera West and Mandera South having the highest level of firewood use at 98% each, while Mandera East's highest level of charcoal use stands at 30%. Mandera East, Mandera North, Mandera South and Mandera West Sub- County headquarters have electricity supply as new electricity coverage extends to Lafey and Banisa Sub-counties.

Only 3% of Mandera County residents use electricity for lighting. A further 33% use lanterns, 13% tin lamps while 37% use wood. The county has untapped potential in solar energy that can be exploited for

household and commercial purposes. Due to its environmental and climatic conditions, the county has a potential for development of sustainable green energy supply, which can be achieved by exploiting solar, wind, biofuel and coal petroleum energy.

The county is highly vulnerable to droughts, heat stress and moisture stress, hazards that affect the production, storage and sales of agricultural produce and livestock products. Flash floods also occur periodically, affecting both crop and livestock production including limiting access to inputs and markets for the sale of products.

Mandera county climate risk profile survey indicates that analysis of historical trends over a 30-35 years period shows that temperatures have been increasing and rainfall decreasing, while climate projections for the period 2021 to 2065 indicate that these trends are expected to continue and the County will remain highly susceptible to droughts and flash floods. Most parts of the county experience long hours (approximately 11 hours) of sunshine in a day. This causes high evaporation rates, leading to withering of most of the vegetation before they mature.

The severity of climate change impacts is observable and devastating at the local level, especially among the poor and ethnic people settled in the marginal and ecologically fragile areas, because of their least adaptive capacities and resilience. Thus, it is crucial to understand the local climatic risks, vulnerabilities and adaptive capacities to develop appropriate coping and adaptation strategies. Climate Change Risk/Vulnerability Assessment has been recognized worldwide as a critical step in adaptation planning and implementation (IPCC, 2014). Current climate change adaptation measures are usually done by assessing vulnerability. It is one of the most important tools to measure the stability of a particular ecosystem and the vulnerability of human communities, and is essential in planning and implementation of the adaptation strategies.

The Participatory Climate Risk Assessment (PCRA) report identifies ward-based climate risks and hazards with their associated impacts within the County and therefore provides an opportunity for an evidence-based community-driven climate change action planning and implementation of the proposed priority adaptation interventions

This necessitated the need to undertake locally led consultative and participatory climate risk assessment taking advantage of the vast traditional and indigenous knowledge to identify key climate hazards and come up with relevant interventions to address the impacts of the identified hazards.

This places the local communities at the centre of decision-making processes from identification of hazards, suggesting key priority interventions and implementation of the actions in a sustainable manner to enhance community resilience

1.1 Policy Context

The County Government of Mandera has enacted Mandera County Climate Change Fund Act, 2021 that establishes Mandera County Climate Change Fund and various climate change committees such as the County Climate change steering committee, County Climate change planning committee and Ward climate change planning committees for management and coordination of climate change issues in the county. The Act requires the County Government to allocate 2% of its development budget to the County Climate Change Fund (CCCF) for implementation and coordination of climate change programs and projects hence the climate change risk assessment will form a basis for evidence-based climate response.

The Mandera County Climate Change Adaptation policy envisages that the county government shall undertake Climate Change Action Planning, Risk Assessment, Vulnerability Assessment and Adaptation planning for effective implementation of climate actions

At the national level, the National Climate Change Framework Policy (2018) and the Climate Change Act, 2016 guides climate response actions by various stakeholders. The Act provides for establishment of climate change governance structures to coordinate implementation of activities at national and subnational levels. Section 19 of the Climate Change Act, requires counties to mainstream climate change in their programmes, plans and functions; undertake climate change action planning as well as establish a climate change governance framework.

Globally, the Paris Agreement was adopted in 2015 with aim to strengthen the global response to climate change by keeping a global temperature rise this century below 2 degrees Celsius above pre-industrial levels. The agreement provides the policy framework at global scale within which countries are expected to address climate change through facilitating climate finance, technology exchange and collaborations for capacity exchange. The Agreement requires counties to set and periodically report their Nationally Determined Contributions for effective tracking of climate action at global scale.

1.2 Purpose of the PCRA Report

Climate Change Risk/Vulnerability Assessment has been recognized worldwide as a critical step in adaptation planning and implementation (IPCC, 2014).

Successful execution of PCRA exercise and preparation of PCRA report is one of the key conditions to be met by the County Government to qualify for and access the Climate Resilience Investment Grants from the National Treasury's Financing Locally Led Climate Action, (FLLoCA) program.

The PCRA report identifies major climate risks, sources of vulnerability and priority adaptation actions to address the identified risks. Through the PCRA process, the local communities identified climate change hazards in their wards, impacts of the hazards and prioritized response actions and interventions for incorporation into the county Climate Change Action Plan (CCAP) and the County Integrated Development Plan (CIDP).

Implementation of Climate change programs and projects by various actors including government agencies, Civil Society Organizations (CSOs) and Private sector in the county shall be guided by this report and the County Climate Change Action Plan (CCAP).

1.3 The Mandera County PCRA Process

Mandera County PCRA Process was implemented in 8 main steps. These include; Formation of the technical working group, training of the technical working group, mapping of stakeholders, preparation for community engagements, conducting participatory risk assessment at ward level, preparation of ward level risk assessment reports, data analysis and preparation for county level multi-stakeholder workshop, multi-stakeholder climate change risk assessment workshop and final report writing as detailed in the section below:

Table 1: overview of the PCRA Process

Step	Activity	Duration in Days
Step 1:	Formation of the Technical Working Group	1
Step 2:	Training of the Technical WG	4
Step 3:	Stakeholder Mapping	1
Step 4:	Preparation for Community Engagements	21
Step 5:	Ward Based engagements on PCRA	14
Step 6:	Data Analysis and Preparation for County Level Workshop on PCRA	15
Step 7:	County Level Workshop on PCRA	2

Step 8:	PCRA Report	5
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Step 1: Formation of the Technical Working Group (TWG)

The Technical Working Group (TWG) was formed in March 2023 following a resolution of a stakeholder consultative meeting of county directors and representatives of various relevant County and National Government departments. The TWG members were drawn from various County and National Government departments and agencies such as water, environment, agriculture, livestock, irrigation, veterinary, gender and social service, special program, education, devolved unit, Public Health, NEMA, NDMA, KFS and KMD. The non-state actors were represented by Islamic relief and DRC. In total, the technical working group had 16 members.

Step 2: Training of the Technical Working Group

The Technical Working Group was trained for 4 days on as from 22nd March to 25th March, 2023 on the PCRA process. The training involved understanding of the process, its relevance in development planning and implementation and how each step of the PCRA process should be conducted as described in the PCRA guidance templates.

The training was supported by WFP and facilitated by a team of experts sourced from the Kenya Red-Cross, ADA Consortium and the County Director for Climate Change from Vihiga County.

Step 3: Stakeholder Identification and Analysis

The stakeholder identification and mapping was done by the Technical Working Group during a stakeholder analysis meeting. The stakeholders were broadly categorized to represent: Individuals/organizations formally responsible for climate action and building resilience; involved in climate action and responses to climate impacts; those with knowledge and expertise relevant to climate adaptation and building resilience as well as community representatives and those impacted by climate change. The TWG identified the following as key stakeholders in maters climate change.

Table 2: Stakeholder Analysis

Those formally responsible for climate action.	**MoALIF, National Drought Management Authority, County Climate Change Unit, Kenya Metrological Department, World Food Program, IGAD, Kenya Forest Services, NEMA, WRA, Special Programmes, Climate Change Directorate (CCD)**
Those involved in climate action implementation.	NDMA, WFP, MOALF, RACIDA, Mandera County Government, IGAD, Kenya Red Cross, Islamic Relief Kenya, Danish Refugee Council, VOPA, Save Children, Action against Hunger, CCU,
Those with knowledge and expertise on climate change.	KALRO, KMD, NDMA, CCU, KEMRI, Kenya Red Cross, MOALF, WRA, Economic Planning, KNBS, KNBS, DRC,

The stakeholders were further categorized based on their influence and interest.

Table 3: Stakeholder mapping and analysis summary

High Influence, Low Interest • Politicians • Quarry Owners	**High Influence High Interest,** • H.E the Governor, Deputy Governor • CECM –, Water, Energy, Environment, Natural Resources and Climate Change • Chief Officers (CCO) –Environment and Climate Change, Energy and Natural Resources, Water, Agriculture, Livestock, Irrigation, Education, Public Health etc. • County Directors: Climate Change; Environment, Energy and Natural Resources; Agriculture, Livestock Production, Veterinary, Economic planning, Public Health; Economic Planning; Water Services; Special Program; and Social Services, Finance • Mandera County Climate Change Steering Committee • Mandera County Climate Change Planning Committee • Civil Society Organizations (DRC, VOPA, Islamic Relief, Mazingira Alliance, Mujtama WRUA • NDMA • Kenya Forests Service and Kenya Wildlife Service • National Environment Management Authority (NEMA) • Elwak and Mandera Municipal Boards • Commercial Banks (KCB, Equity Bank, NBK)
Low influence, Low Interest • Blacksmith • Miners • Charcoal Traders • Quarry Workers • Deforesters	**Low Influence, High Interest** • County Environment Committee(CEC) members • Environment officers • Sub County Water Officer • Ward Climate Change Planning Committee

Step 4: Preparation for ward level engagements

Before the ward engagement exercise was kicked off on 27, April, 2023, the Climate Change Unit sensitized the Ward Climate Change Planning Committees and the Ward Administrators of the planned climate change risk assessment exercise and participants mobilized with the support of Ward Administrators. The Technical Working Group was divided into 5 groups of 3 officers and each team was assigned to 1 sub-county to undertake ward-level community engagement. Logistics for undertaking the exercise, engagement tools, field program and other materials relevant to the community engagements were prepared in advance. These materials include: the program, community guiding questions and the note takers feedback forms.

Step 5: Engagement of Communities at Ward Level on PCRA

The PCRA field engagement exercise was undertaken from 27th, April to 11th May, 2023. During the exercise, averages of eighteen (18) to twenty-one (21) participants were mobilized in each of the 30 wards in line with the mobilization criteria adopted. The participants mobilized consisted of different livelihoods groups such as farmers, traders, the marginalized, women, youth and Persons living with Disabilities in addition to the members of the Ward Climate Change Planning Committees. Other participants included ward water and agricultural officers, Sub-County administrators, ward/village administrators, ward managers, area chiefs and other technical officers with ward level mandate. The ward-level community engagement exercise took 2 days per ward translating to 10 days per sub-county.

The community engagement exercise was divided into sessions. In the first session of the community meetings, the community members were taken through an introduction session which covered the purpose and significance of the PCRA process, overview of climate change trends followed by explanation of the process and its application in the county planning and development cycle.

The community engagement meetings started by a sketching a climate hazard and community assets map. Thereafter, the climate change risk assessment tools were administered to determine the main hazards, prioritize them, identify the level of vulnerabilities, highlight local response actions and propose adaptation strategies. Through this process, the local communities managed to identify key climate change risks and hazards affecting them and suggest measures to attain resilience.

Step 6: Data Analysis and Preparations for County Level Participatory Climate Change Risk Assessment

Following the ward level PCRA field engagement, the TWG took three days to develop ward level PCRA reports using the data collected from the field engagement capturing the main hazards and prioritized response actions per ward. The team took a further two days to consolidate the ward PCRA reports into sub county PCRA reports. The Climate change unit then engaged the director economic planning and the county director meteorology to provide inputs on the

socio-economic status and historical, current and projected climate scenarios for the county respectively. A GIS consultant was also engaged to digitize the prevalent climate hazard maps and their geographic distribution across the county. At this point, a county PCRA report was drafted.

A one-day meeting was then convened for the Technical Working Group to deliberate on and develop a program for the multi-stakeholder workshop. A concept for the workshop was developed which entailed a summary of the report, background of the exercise, objectives, program and list of invitees.

Step 7: County Level Workshop on Participatory Climate Change Risk Assessment

A three-day workshop was held from 25th to 26th May 2023 at Granada hotel in Mandera Town. The objective of the workshop was to validate the findings from the ward level community engagement and acquire inputs of the various stakeholders to improve the draft report. The workshop had 45 participants out of the 55 that were invited. The participants included representatives from county line departments of Environment, Water, Agriculture, Livestock, Veterinary, Irrigation, Gender, Youth, Special programs, education, public participation and civic education and public health, National government agencies involved in climate action like NEMA, NDMA, KMD and KFS. Non-state actors present included Danish refugee Council, RACIDA, Care international and Islamic relief and Community representatives especially those from Marginalized groups.

The workshop commenced with opening remarks from the County Executive Committee Member for Water services, Energy, Environment, Natural resources and Climate Change, emphasizing the importance of participatory approaches in climate risk assessment and the need for collaboration among stakeholders.

The participants were then presented with an overview of the participatory climate risk assessment methodologies and their significance in capturing local knowledge, perceptions, and vulnerabilities. Highlights were made on the key steps involved in the processes, including hazard identification, prioritization, local responses and adaptation strategies preferred by the community members.

The wards were clustered into six sub-counties of five wards each due to their geographical proximity and similarity of livelihoods. The Participants divided into six groups where each group prioritized climate hazards of one sub-county, compared them with those identified at community level and updated the hazard maps.

Step 8: Participatory Climate Risk Assessment Report

After inputs were gathered from stakeholders during the workshop, the technical team retreated immediately for five days to consolidate all the information and come up with second PCRA draft report. A technical expert contracted by the climate change unit was present to provide expert opinion and review before the final draft was developed.

CHAPTER TWO: MANDERA COUNTY CLIMATE HAZARD PROFILE

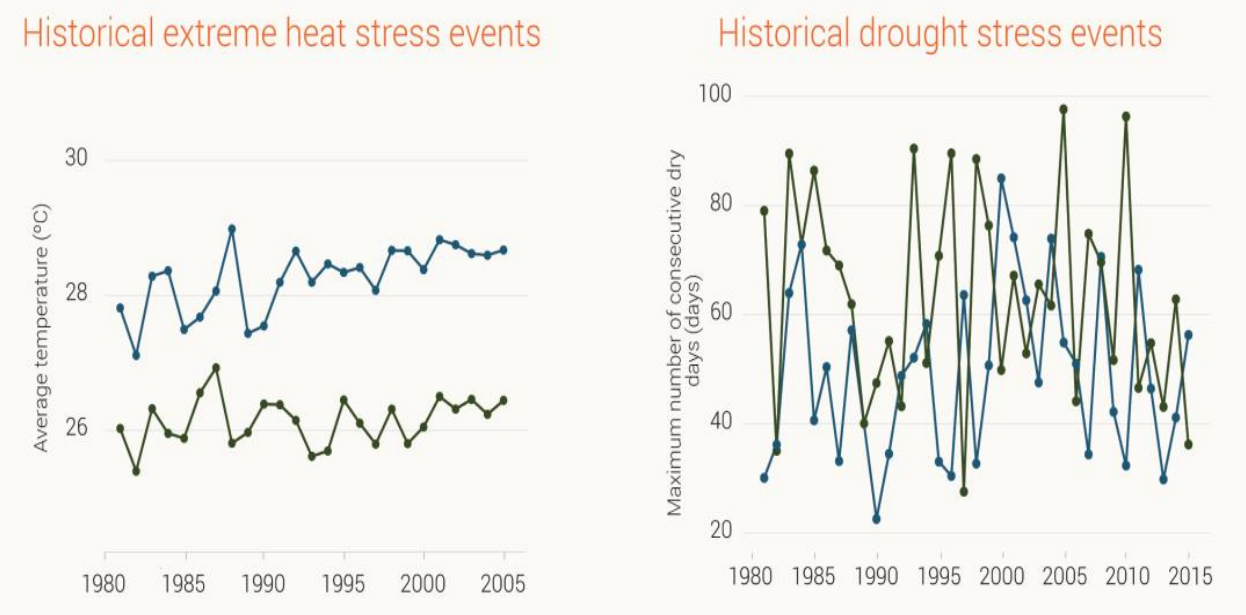
2.1 Current and Historical Climate Hazards and Trends

Mandera County has two rainfall seasons; MAM (March, April and May) and OND (October, November and December) with annual average rainfall of 255mm. The frequency of drought occurrence has increased with drought cycles reducing from the traditionally known 10 years, to 2-3 years.

The main climatic hazards in the county include prolonged droughts, erratic and unpredictable rainfall patterns, flash floods, pest and diseases, Resource conflict and invasive species. The climate outlook for the county indicates increased frequency and severity of dry spells, heat stress and intense rainfall events as well as continued changes seasonal patterns

Over the past 30-35 years, Mandera has experienced rising temperatures and decreasing rainfall. Climate projections suggest this trend will worsen, leaving the county vulnerable to droughts and flash floods. The average annual temperatures in Mandera exceed 25°C, while rainfall averages 255mm. Historical analysis reveals a 1°C increase in first-season temperatures over 25 years (1981-2005) and a 0.2°C increase in second-season temperatures. Precipitation trends show a 50mm decrease in the first season and a slight increase in the second season over 35 years (1981-2015).

Figure 2: Historical and Current Climate Trends



Source: Mandera county climate risk profile

2.1.1 Precipitation and temperature trends in Mandera County

From the findings we assessed past and current trends of precipitation and temperature, and predicted related hazards from these two variables. These hazards included extreme hydrological events like flash floods, droughts, moisture stress, heat stress, and changes in the start and length of the growing seasons.

In the past, rainfall period was longer and more reliable but in the recent past rainfall occurrence has become low, erratic and unreliable with shorter rain period. However, the intensity of the rain has increased leading to flashfloods, soil erosion and destruction of infrastructure.

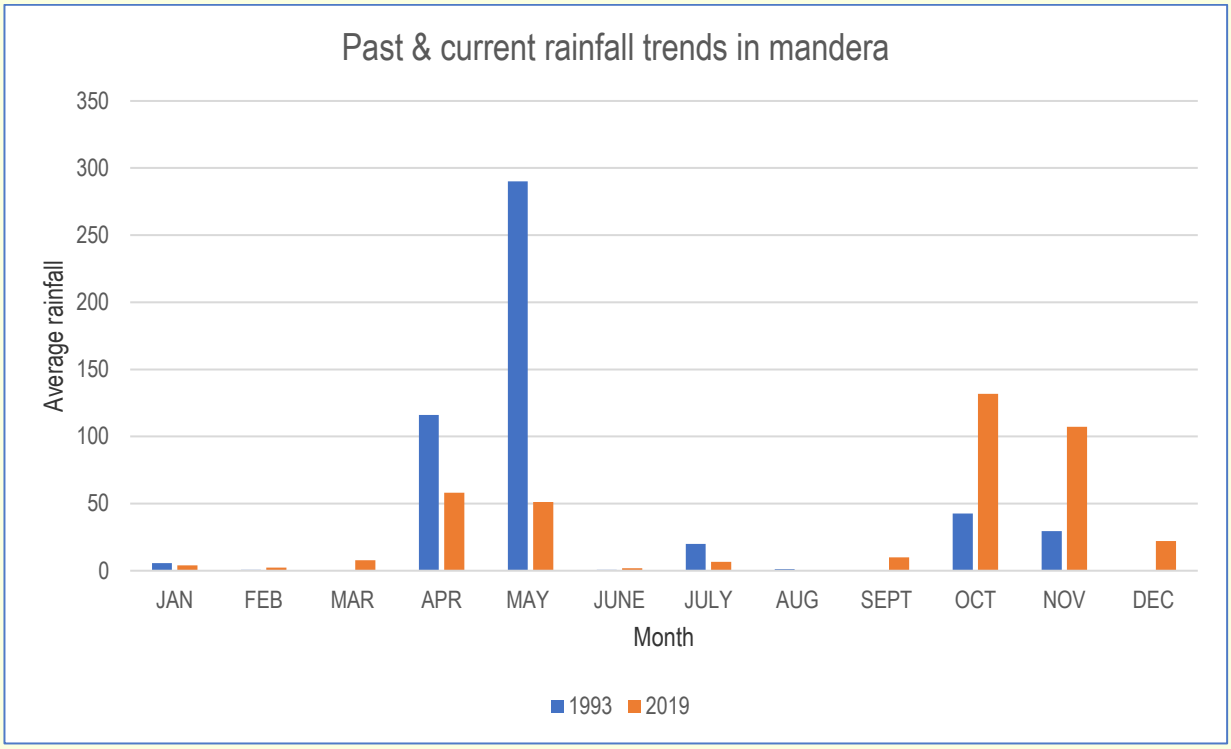
As rainfall frequency and intensity continues to become erratic and predictable, drought has become more severe and intense across Mandera County. This has led to increased instances of water scarcity which threatens the lives of both humans and livestock. In this regard, it is evident that the community vulnerability in recent years has increased.

Temperatures were moderate in the past but the current trends show the maximum temperatures in the county are increasing while the minimum temperatures are reducing.

From the interactions with communities, trends relating to rainfall and temperature were:

- Mandera County experiences a bimodal rainfall pattern. However, in recent years the amount of rainfall has decreased and distribution varied significantly, becoming erratic and unpredictable.
- The County is known for its high temperatures especially during the dry season. The temperatures have increased over the years and became more extreme leading longer hot season and shorter cold season.

Figure 3: Average monthly rainfall in 1993 and 2019.



Source: Kenya Metrological department

The graph shows that the seasonal shifts in rainfall patterns 25 years apart. The rainfall amounts have reduced over years with increase in OND rains over the MAM rains.

2.2 Exposure and vulnerability profiles of the county

The main source of livelihood in Mandera County is livestock rearing which is vulnerable to drought. Prolonged drought caused scarcity of water and pasture that affected the livestock directly resulting to death of the livestock. The vulnerability of the community has increased across the entire County.

Community interactions revealed that drought has caused mass death of livestock increasing the poverty level in the county. Additionally, flood has adversely affected communities living along the riverine leading to crop destruction.

Children, Expectant and breastfeeding mothers, PWDs and elderly persons are the most venerable members of the community in the County due to their weakness to cope with the impacts of the hazards. Poor households are also prone to the effect. Widows and divorced women alt are also affected due to their lack of financial and physical support.

i. Households that depend on livestock for livelihoods

The main economic activity for most of the households in Mandera County is livestock husbandry which is the main source of livelihood. However, due to the prolonged drought coupled with erratic and unpredictable rainfall patterns these households are exposed to the impacts of climate change. Women and children are mainly affected by the impacts of climate change, children tend to drop out of school during drought as they migrate with their families, and women are left at home to bear heavier responsibilities of taking care of the family when their male counterparts move with livestock to look for water and pasture. These further exposes women to risks of gender-based violence such as rape. Other unsustainable practices that expose this category of households to greater impacts of climate change include overstocking, overgrazing, environmental degradation through unplanned settlements among others.

ii. Households that depend on crop farming for livelihoods

Except along river Daua where irrigation farming is practiced, most of subsistence farming in the county depends on rain. Therefore, with the frequent changes in rainfall patterns and increased frequency of drought these households are mainly exposed to the impacts of climate change. Fluctuations in the onset of and intensity of the rains, post-harvest losses, increased pests and diseases affect the small-scale farmers. Therefore, there is need for the county to invest in rain water harvesting technology in order to increase availability of reliable sources of water for these farmers to cultivate their farms all-year round.

Crop farming through irrigation is mainly practiced along river Daua where various crops are planted for consumption and commercial purposes. However, farming along river Daua is mainly affected by unpredicted flash floods that destroy most of the farms and the irrigation infrastructure along the river coupled with high cost of fuel leading to low production among farmers. This requires adequate investment in flood control mechanisms, harnessing of solar energy for irrigation, community education to avoid encroachment and farming on riparian area along the river.

iii. Small scale traders

The main business activities in Mandera are small scale traders dealing in the movement of goods and services, particularly livestock, agricultural products, and consumer goods. Seasonal variability in supplies of Livestock produce affects traders; in addition, infrastructure destruction during heavy rains affects transportation of goods especially those sourced from Nairobi and other neighboring counties.

The geographical location of Mandera County at the border of three counties Kenya, Ethiopia and Somalia provides critical opportunity for cross-border business among the residents of the three countries. However, this opportunity has not been fully exploited mainly due to lack of enabling environment to facilitate free movement of people and goods/services into and out of the county. To achieve sustainable exploitation and realization of this opportunity, the relevant stakeholders need to apply a holistic approach that can ensure effective integration and interaction among the border communities, enhance intelligence sharing to promote peace building and peaceful coexistence as well as development of infrastructural and social amenities to support and enhance business between the 3 countries.

iv. Households with low levels of income

The county is characterized by very high poverty levels (89%) and food insecurity, with for instance 36% of children below the age of 5 being stunted, and a high dependence on food relief for both humans and livestock (Mandera County risk profile). These are largely attributed to the harsh climate and historical insecurity in the county making the communities more vulnerable.

2.3 Differentiated impacts of climate hazards and risks

The impacts of climate change in Mandera County are often interconnected, and the vulnerabilities of different groups, such as farmers, pastoralists, Elderly, Women and marginalized communities vary differently.

Many communities in Mandera rely on livestock rearing as their primary livelihood. Climate change has disrupted grazing patterns and the availability of water for their animals, degraded rangelands leading to loss of livestock, reduced milk production, and increased conflicts over scarce resources.

Farmers in Mandera face challenges in growing their crops due to changing rainfall patterns, increased frequency of droughts, and rising temperatures. This has led to water scarcity and reduced crop yields.

Mandera County is home to various indigenous communities with rich cultural heritage and traditional knowledge. Climate change has affected their way of life, including changes in the availability of medicinal plants, disruption of traditional farming practices, and loss of biodiversity. These impacts have eroded the cultural fabric and resilience of indigenous communities.

Women and children often bear the brunt of climate change impacts. Women are primarily responsible for household chores, including water collection and food preparation. Water scarcity and decreased

livestock productivity has increased their workload and limited their access to economic opportunities. Moreover, climate-related disasters have disproportionately affected children, with increased risks to their health, education, and overall well-being.

Climate change has exacerbated existing vulnerabilities against Vulnerable and Marginalized Groups (VMGs). Vulnerable and marginalized groups, such as the elderly, disabled individuals, those living in poverty and the minority clans and indigenous people face heightened risks from extreme weather events and limited resources to recover from their consequences.

2.4 Spatial Distribution of Risks

Mandera County has six sub-counties namely Mandera East, Mandera North, Banisa, Mandera West, Mandera South and Lafey. The spatial distribution of climate hazards in the County exhibits distinct patterns across the county.

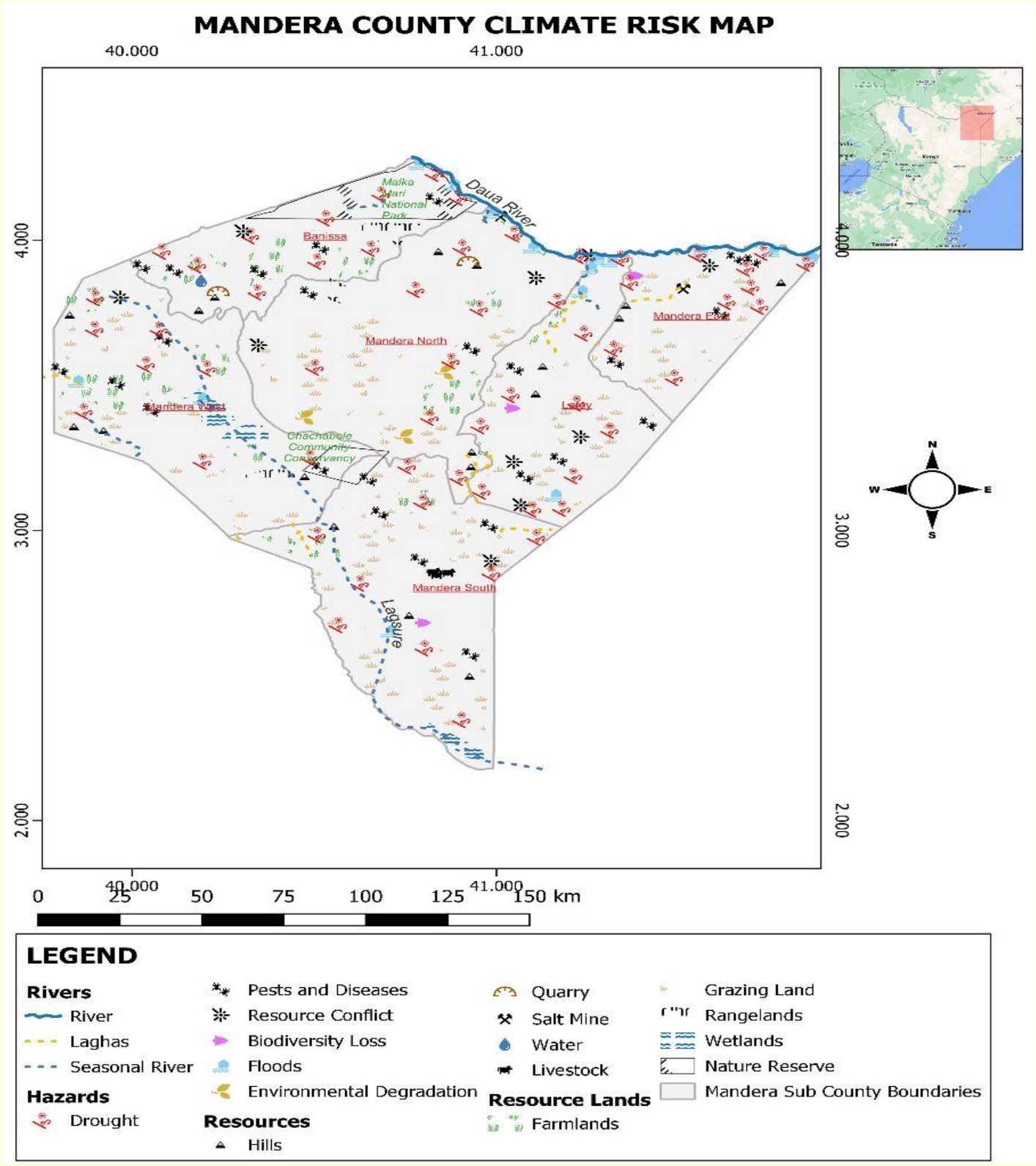


Figure 4: Map of Mandera County showing spatial distribution of Hazards

The county is prone to various climate hazards, including droughts, floods, and extreme temperatures. The southern parts of Mandera County which covers the sub-counties of Lafey and Mandera South are predominantly affected by recurrent droughts, characterized by prolonged periods of limited rainfall and water scarcity. This leads to significant challenges in agriculture, livestock rearing, and overall food security.

On the other hand, the northern and western parts of the county which cover parts of Mandera East, Mandera North, Sala ward in Lafey, Mandera west and Parts of Banisa sub-counties experience occasional flash floods, particularly during the rainy seasons, which result in infrastructure damage, displacement of communities, and the spread of waterborne diseases.

Additionally, Mandera County encounters extreme temperatures, with the eastern areas facing high levels of heat stress and the western parts especially Mandera west and Banisa sub-counties experiencing lower temperatures due to their proximity to the Ethiopian highlands.

The spatial distribution of climate hazards in Mandera County reflects a complex interplay of geographical factors, which necessitates targeted strategies and interventions to address the unique challenges faced by different areas within the county.

Figure 5: Climatic hazards affecting various livelihoods including wild animals in Mandera County

2.4.1 Mandera South

Mandera south sub county consists of five wards namely: Shimbirfatuma, Kutulo, Wargadud Elwak South and Elwak north. The climate hazards dominant in Mandera south sub county are drought, floods and desertification. These hazards created extreme weather conditions threatening human health, food and water security.

Drought has adversely affected the agro-pastoralists communities in this sub-county which led the risks of water scarcity, decrease in pasture and loss of crops. Rangeland degradation is also rampant which resulted from human activities like mushrooming of new settlement, deforestation and quarrying activities hence reduce grazing Lands for livestock.

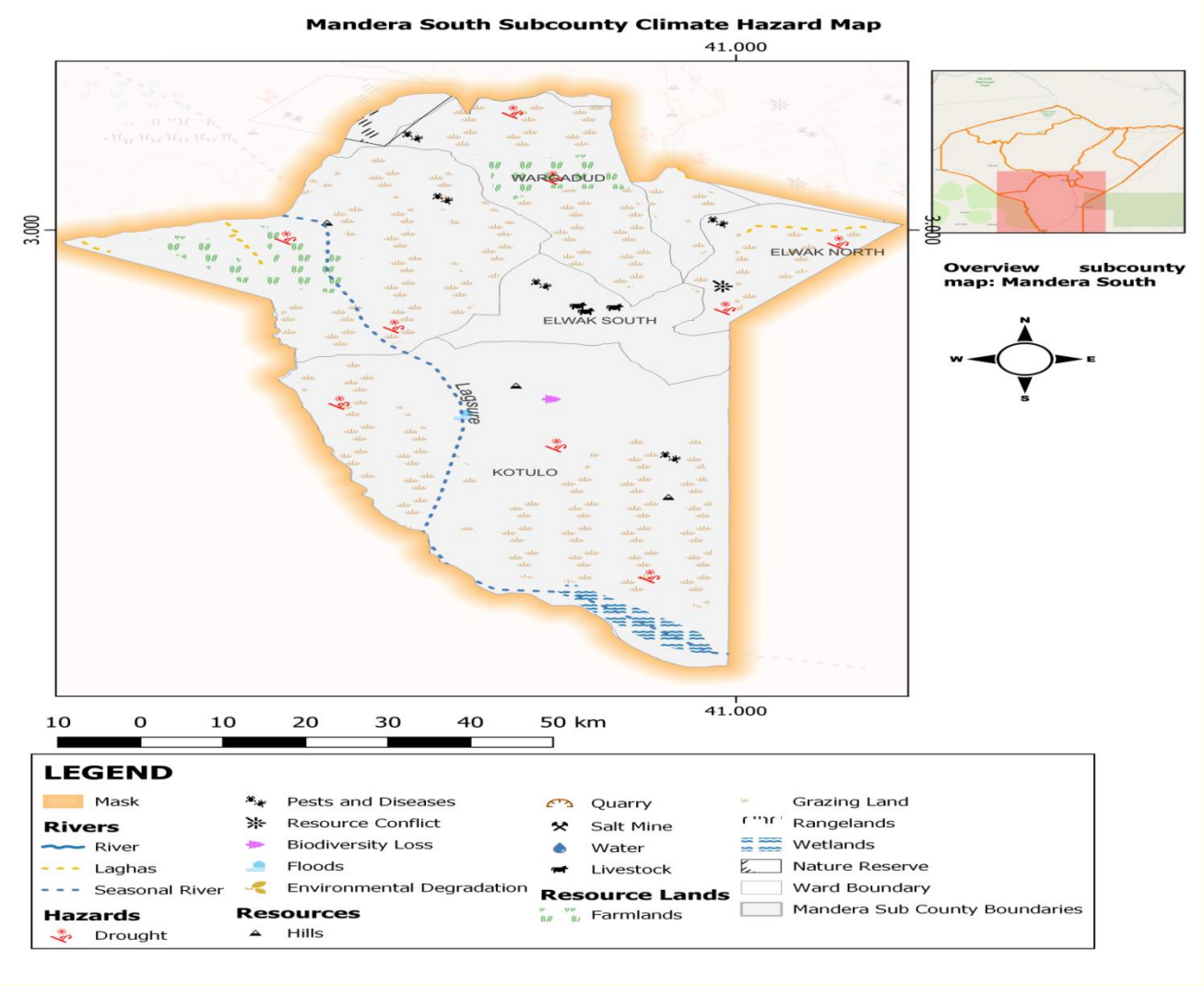


Figure 6: Mandera South Sub-County Hazard Map

2.4.2 Mandera west

Mandera west sub-county consists of five wards. These are Dandu, Gither, Lagsure, Takaba South and Takaba Town. The main climate hazards dominant in Mandera west sub county are Drought, Flash flood, livestock disease, Resource conflict and extreme heatwaves. This has created extreme weather conditions threatening human health, food and water security, Wetlands have greatly reduced due to climatic stresses and human interference such as encroachment

Livestock disease is a major risk affecting livestock during the dry seasons. This has increased the vulnerability of livestock and communities cope by migrating to other sub-counties or across the border to Ethiopia.

Farmers are also vulnerable to flood which leads to destruction of crops and infrastructure thus leading to soil erosion in the farm land and reducing its fertility.

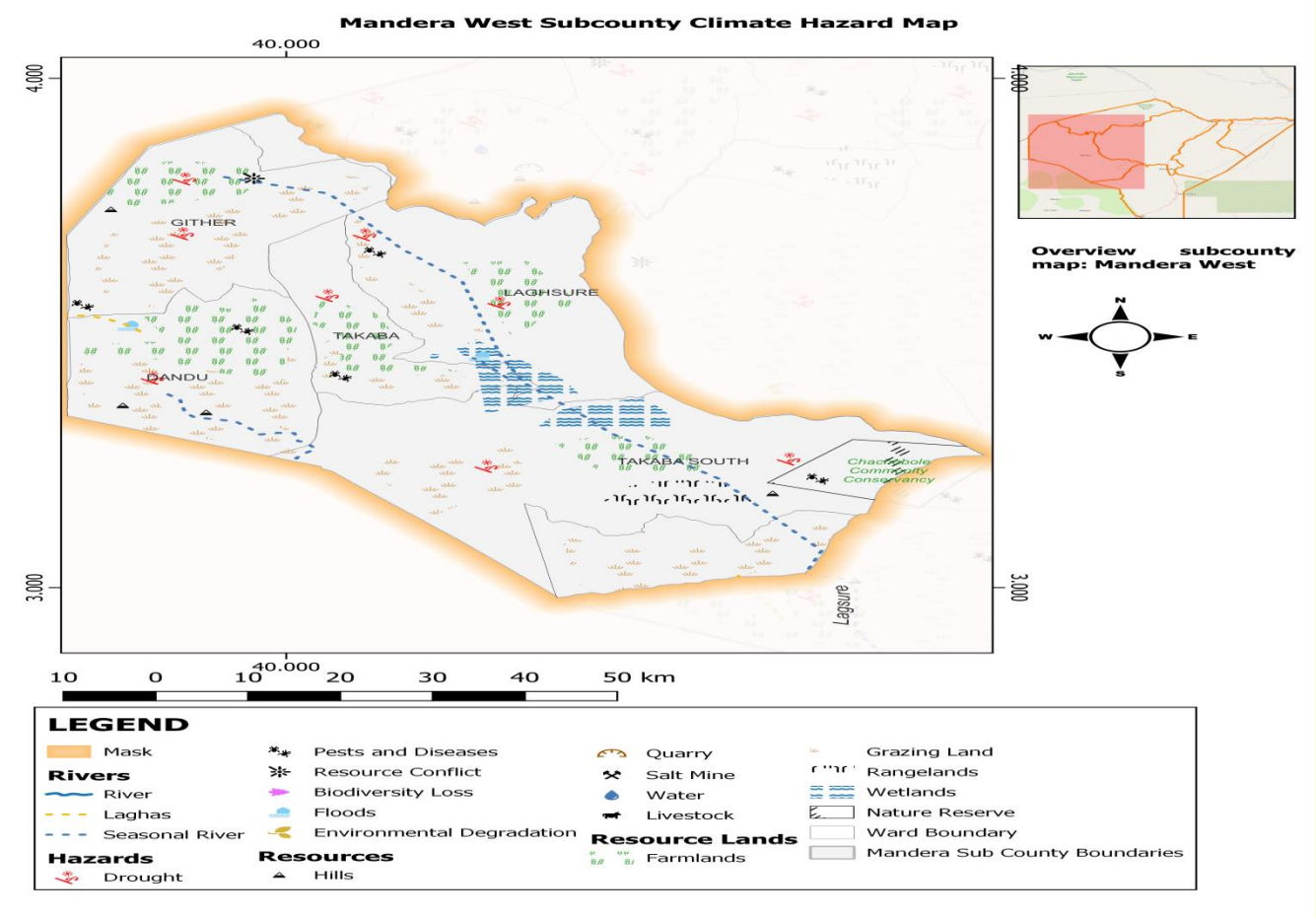


Figure 7: Mandera West Climate Hazard Map

2.4.3 Banisa Sub County

Banisa sub-county consist of five wards namely: Banisa, Derkale, Kiliwehiri, Malkamari and Guba .The main hazards facing Banisa Sub-County include drought, floods, pests & diseases, and attacks from wild animals. Historically, 20 - 30 years ago, Banisa Sub-County received predictable rainfall for about three months each season that would sustain the community which was predominantly pastoralist.

However, due to current trends in climate change, rainy seasons have become more erratic, unpredictable, and unreliable with increases in temperature also recorded. Dry spells, which have become hotter, leading to droughts have become more frequent and persistent, lasting more than five months, forcing the people to seek alternative livelihoods including Agro-pastoralism.

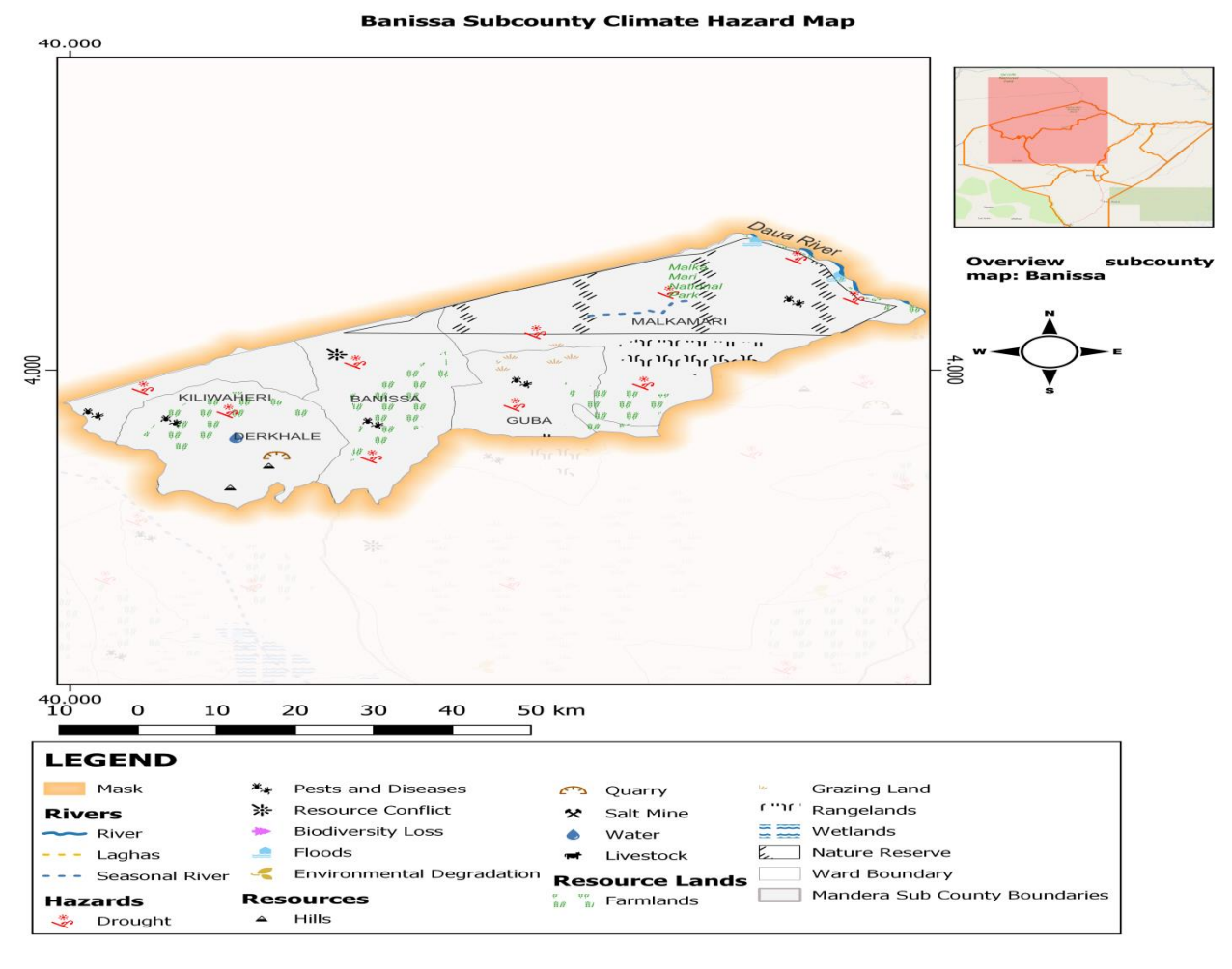


Figure 8: Banisa Sub-County Risk Map

2.4.4 Lafey Sub County

Lafey Sub- County has five wards namely Sala, Fino, Alungu, Lafey and Warankara, The Sub- County is characterized by an arid and semi-arid climate and is susceptible to a range of climate risks, including drought, diseases, floods, and extreme temperatures. The spatial distribution of climate risks in Lafey Sub- County varies depending on the specific risk and the ward within the sub-county.

As a result of these climatic hazards, shortage of pasture, Scarcity of water, death of livestock, loss of lives and property and crop failure are frequently experienced.

Sala ward which is located along river Daua is affected most by floods when the river breaks its banks during the rainy season. The floods lead to destruction of crops and irrigation infrastructure established by the farmers.

Climate change and associated environmental stresses has exacerbated existing conflicts between pastoralists in the area and against other communities over access to resources such as water and pasture. Recent Conflicts in Yetho location in Alungu ward has led to displacement, loss of livelihoods, and even violence.

Climate change has increased the prevalence of certain human diseases such as dengue fever, Chinkunya and Cholera while there has been outbreak of animal diseases that affect livestock, such as tick-borne diseases, which have had a devastating impact on livestock and livelihoods across the sub-county.

Lafey Sub- County experiences high temperatures throughout the year, but these temperatures are more extreme in areas. The central and eastern parts of the Sub- County covering Fino and Lafey wards are particularly susceptible to extreme temperatures.

Due to its proximity to the porous Kenya-Somalia border, Lafey Sub-County suffered from problems of violent extremism and youth radicalization. This has resulted in disruption of livelihoods through loss of business opportunities, limited movement of people and goods, loss of lives and properties among other negative impacts.

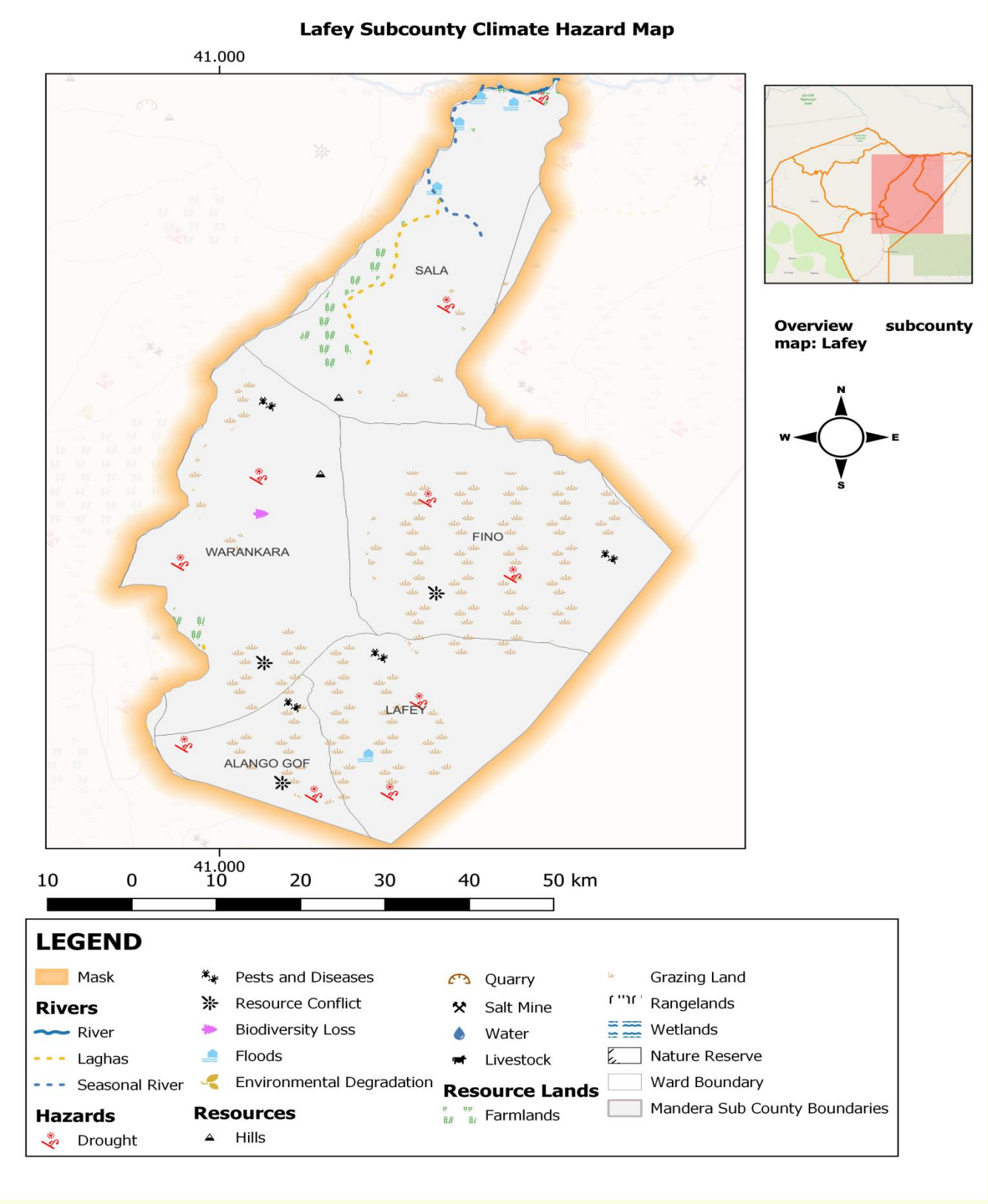


Figure 9: Lafey sub-county Hazard Map

2.4.5 2.4.5 Mandera East

Mandera East sub-county has a total of 5 Wards. These are Township, Neboi, Khalalio, Libehiya and Arabia wards.

The main climatic hazards facing the sub-county are drought, Floods, Pest and diseases and heatwaves.

The spatial distribution of these climate risks varies across Mandera East Sub-County. Certain areas are more vulnerable to drought due to factors such as soil conditions, topography, and distance from water sources. Similarly, flood-prone areas are influenced by proximity to rivers or areas with poor drainage.

The Sub-County is prone to recurrent droughts, which significantly impact water availability, agriculture, livestock, and overall food security. Droughts are usually more severe in wards that are far from river Daua. These are Arabia Ward, Libehia Ward and some parts of Khalalio ward where water sources are scarce or completely dry.

The sub-county also experiences flash floods during heavy rainfall events. The sudden nature of these floods results in property damage, infrastructure destructions, and potential loss of life. Floods often occur in Township, Neboi and Khalalio wards which are located in low-lying areas and along the riverine

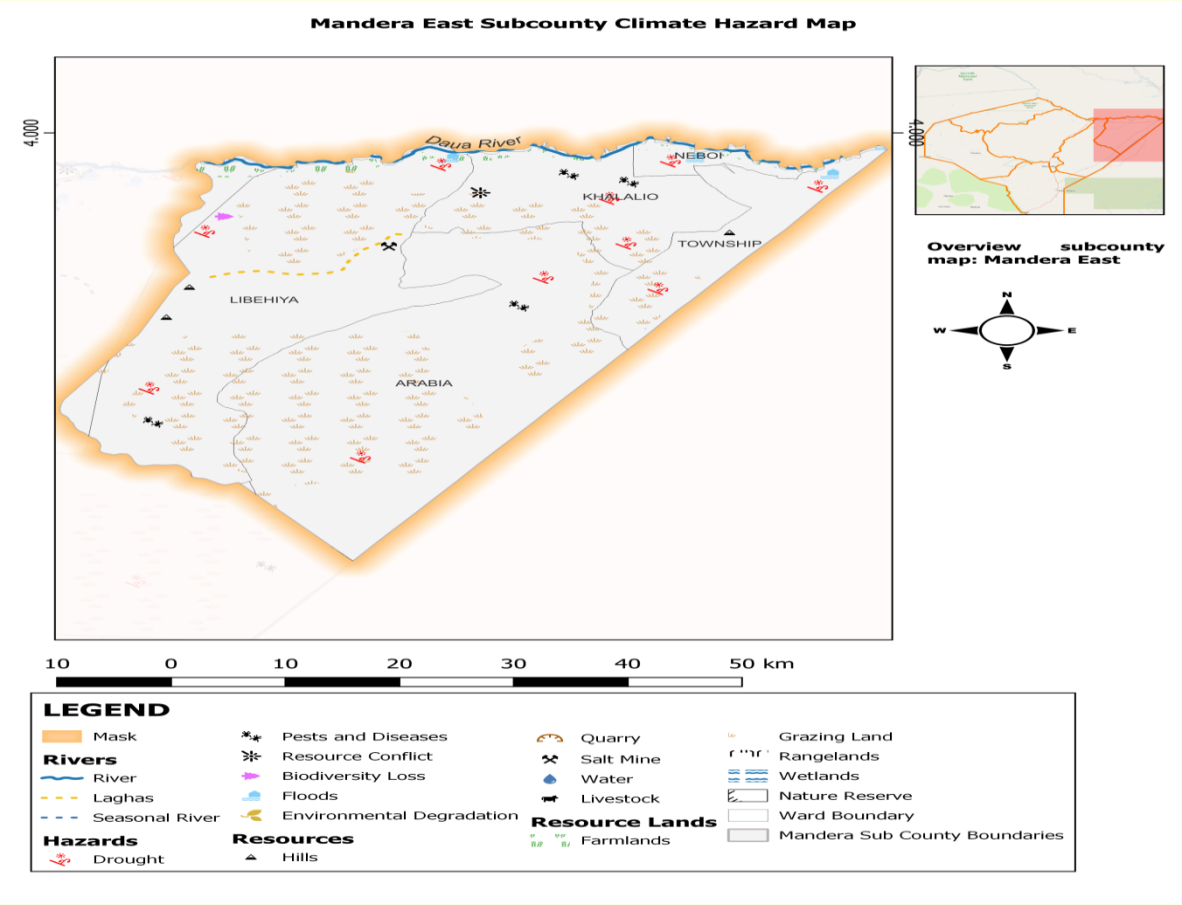


Figure 10: Mandera East Sub-County Climate Hazard Map

2.4.6 Mandera North Sub-County

Mandera North Sub- County is made up of five elective wards which include: Ashabito, Guticha, Marothile, Rhamu and Rhamu Dimtu. It is situated in the northern region of Mandera County, bordering Ethiopia to the north. The sub-county is characterized by a predominantly arid and semi-arid climate. As such, the availability of natural resources in the area is relatively limited.

The major livelihood of this Sub- County is agro-pastoralism, with livestock rearing including cattle, goats, and camels being the main economic activity. Sale of livestock and livestock products is a major source of income for the local population. Some residents also engage in small-scale farming and trade.

The Sub- County has seasonal rivers (lag) and water catchment areas that provide water for both human and livestock consumption. These include River Daua and seasonal tributaries such as *lag abaar* and *aliwando.* There also deposits of various minerals, including limestone and gypsum.

The main climate change hazards in the sub-county include, Drought which has adversely affected the agro-pastoralists communities and led to water scarcity, decrease in pasture and loss of crops. This has further led to loss of livestock and pasture, and also loss of crops for the farmers who highly depend on rain fed agriculture. Due to the prolonged drought the pastoralists tend to migrate in search of water and pasture as far as Ethiopia and Somalia. Conflicts have been witnessed in several areas across the county. Floods have also led to loss of life for both animals and human beings.

It is mainly experienced in Rhamu Dimtu and Rhamu wards as river Daua breaks its banks during the rainy seasons and whenever it rains heavily in the Ethiopian highlands where it originates from, leading to loss of lives and destruction of crops and properties especially in Rhamu Dimtu and Rhamu wards. Erratic rains have also led to flash floods that have caused flooding of the seasonal lagas such as lag *abaar* in Rhamu Dimtu ward, *Qow gal* in Guticha ward and *Aliwando* Rhamu ward causing loss of lives, crops and destruction of infrastructure such as boreholes, drifts, and bridges interrupting road transport.

Figure 11: Active quarrying activities in Mandera East resulting in land degradation

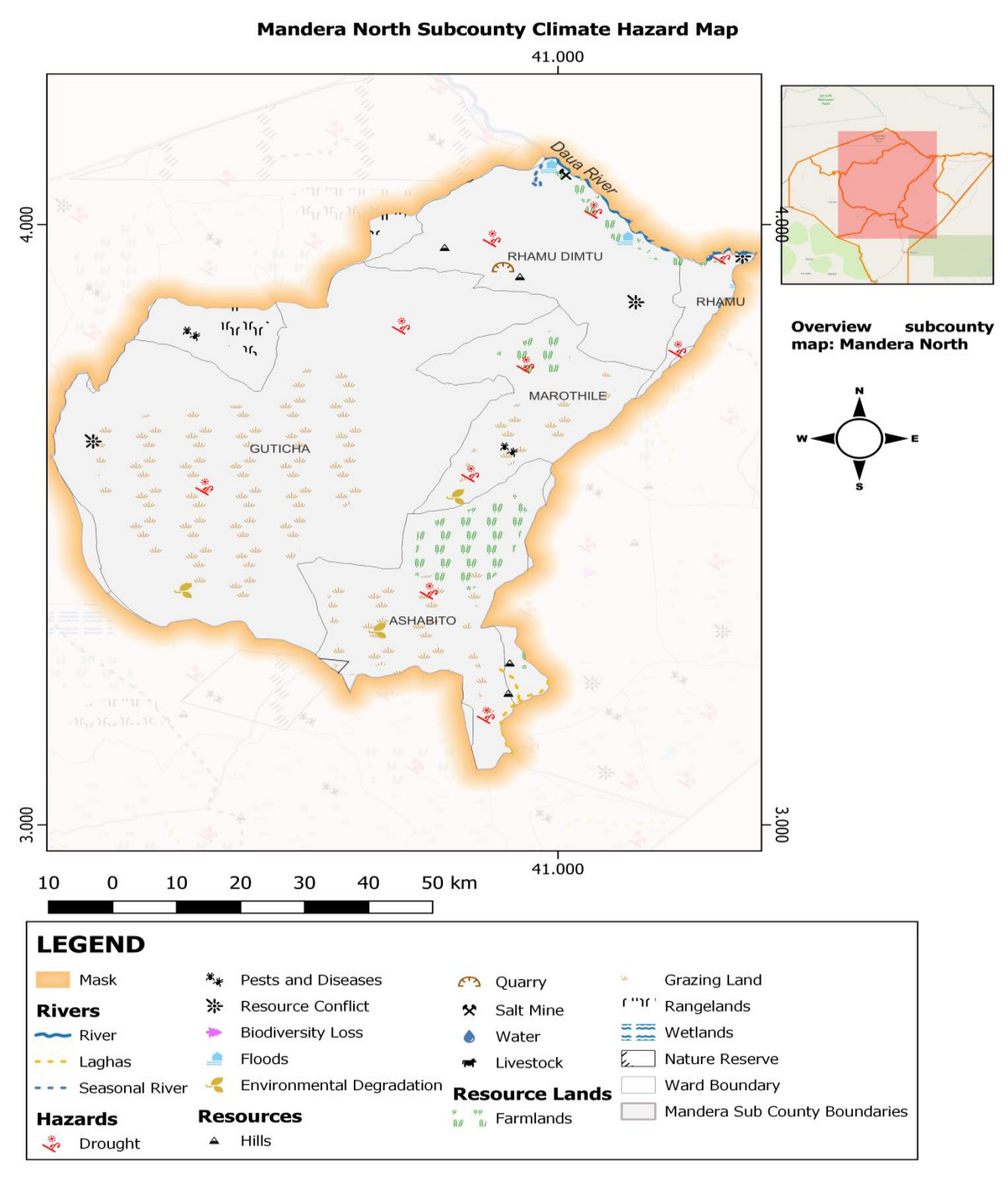


Figure 12: Mandera North Sub-County Hazard Map

Below is a summary of the risks caused by each hazard and the wards that are affected.

Table 4: Summary of climate risks

Climate Hazard	Risk	Wards
Drought	Water scarcity	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara.
	Food insecurity	
	Livelihood disruption	
	Loss of Livestock	
	Conflict and migration	sala, Rhamu, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Dandu, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Wargudud, Alungu, Warankara.
	Human-wildlife Conflict	Malkamari, kiliwheri, Takaba, Dandu, Takaba south and Lagsure, Sala,
Pests	Rangeland degradation	Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither Dandu, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Wargudud, Alungu, Lafey, fino, Warankara.
	Desertification	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara.
	Reduced agricultural productivity	Neboi, Township, Khalalio, Libehiya, sala, Rhamu, Rhamu dimtu, Banisa, Derkale, Malkamari, Gither Dandu, Takaba town, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, fino, Warankara.
	Shortage of pasture	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither Dandu, Takaba , Lagsure, Takaba south, Shimbir
	Animal diseases	
	Malnutrition	

		Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara.
Floods	Property damage	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither Dandu, Takaba town, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara.
	Loss of life	
	Infrastructure damage	
	Water-borne diseases	
Heatwaves	Heat-related illnesses	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither Dandu, Takaba town, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara.
	Reduced productivity	
	Energy demands	
Wildfires	Property damage	Elwak North, Elwak South, Libehiya, Dandu, Takaba south,
	Loss of life	
	Ecosystem disruption	

CHAPTER THREE: FUTURE CLIMATE SCENARIOS FOR THE COUNTY

3.1 National and downscaled climate change projections

Mandera County is generally dry and hot and therefore unsuitable for rain fed crop production. Mean annual temperatures are often above 25°C in most parts of the county. The county receives an average annual rainfall of approximately 255 mm (GoK, 2013); with the long rains falling in April and May whereas the short rains fall in October and November. These factors make Mandera County one of the driest counties in Kenya, with a high vulnerability to drought, heat stress and moisture stress. Flash floods also occur due to episodes of intense rainfall. However, drought remains the greatest threat to agricultural production and livelihoods in the county.

Projection indicates increases in average global temperatures are expected in the next 100 years as it has during the last 100 years. The National climate projections indicate that there will be a 1.7°C increase in average temperatures by 2050 and 3.5°C by the end of the 21st century (CIAT 2021). The number of hot days and hot nights will increase by 2050 and consequently reducing the number of cold days and nights. Rainfall is expected to increase slightly by 2050, especially for the 'short rains' which occur between October and December. Precipitation will remain highly variable and uncertain with extreme rainfall events likely to increase in frequency, duration and intensity. The period between heavy rainfall events is likely to increase as well as the proportion of rainfall that occurs in extreme rainfall events.

3.2 County future climate scenarios

Future climate projections for Mandera County based on two representative concentration pathways (RCP 4.5 and RCP 8.5) indicate that under both scenarios there is expected to be a continued increase in mean temperatures in both seasons. The rising temperatures are expected to result in a continued and marked increase in heat stress days by at least 25 days in the first half of the year (up from just over 45) and by at least 8 days (up from approximately 3 days) regardless of the emissions levels. Changes are also expected to occur in season onset and duration. A moderate increase in the length of the second season is expected under the high emissions scenario, and an early start of both seasons combined with a slight decrease in the length of the second season projected under the low emissions scenario. Under both scenarios slight reduction in average annual precipitation is expected in the first season compared to historical averages. However, under the high emissions scenario average second season rainfall is expected to rise slightly.

Rainfall intensity under both scenarios is also expected to increase along with an associated increase in flood risk in both seasons. Although the projections under the two GHG emissions scenarios show some differences, both indicate the possibility of increasingly variable rainfall, shifts in season onset and duration, and continued rises in temperatures with these resulting in an increased risk of droughts, dry spells and floods.

Figure 13: Future climate projections in the County

Source: Mandera county climate risk profile

From the projections, there is likelihood of climate hazards increasing in intensity, frequency and duration. This may have implications on the livelihoods and environment such as reduced crop yields, reduced reproduction and milk production in livestock, increased soil erosion and land and increase in the likelihood of landslides. The interaction between human activities and climate change will alter the occurrence of hazards.

3.2.1 Likely future Impacts

The projected increase in temperatures will result in heat stress and health risks as well as reduction in agricultural productivity. Erratic, unpredictable and poor distributed rainfall is likely to result in water scarcity and reduced crop yield which in turn increase food and water insecurity in the county.

Increased frequency and intensity of extreme weather events such as drought and flash floods leading to infrastructural damage, displacement of people, destruction of crops, crop failure, Loss of lives and livelihoods.

Increased conflicts over scarce resources will lead to loss of lives, displacement, migration of people, Destruction of crops and farmlands by wild animals including monkey and loss of biodiversity.

Women, youth, VMGs, and PLWDs will be more likely to be exposed to the impacts of the changing climate due to their low resilience levels.

Because of the projected climate extremes, Women will likely be affected more due to the gender roles, similarly expectant mothers will be more exposed to human diseases such as malaria as their immune system is weak. Old age and associated health complications hampers ability to cope with climatic hazards and their impacts. Similarly, children may likely suffer more due to high incidences of vector borne diseases such as, cholera and other diarrheal diseases due to their weak immune system.

CHAPTER 4: EXISTING ADAPTATION STRATEGIES

4.0 Introduction

Mandera County is grappling with a range of climate-related challenges, including increased temperatures, erratic rainfall patterns, and prolonged droughts. In response to these threats, local communities in Mandera County have developed various adaptation strategies to mitigate the impacts of climate change and ensure their resilience.

During the PCRA process, various community groups including farmers along river Daua, pastoralists and various social groups shared the adaptation efforts they undertake to minimize the impacts climate change has on their livelihoods

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

Given the County's vulnerability to drought, the local communities through support from both national and County governments as well as non-state actors have adopted various adaptation strategies to cope with the impacts of climate change.

Some community members have adopted water harvesting and storage techniques such as water pans and sand dams. These structures help collect and store rainwater during the rainy seasons, providing a crucial source of water during dry periods.

Many households in Mandera County rely on livestock farming for their livelihoods. To adapt to changing conditions, some communities have diversified their livestock holdings by incorporating more drought-resistant breeds, which are better suited to arid and semi-arid environments.

To anticipate and prepare for extreme weather events, communities apply traditional community-based early warning systems. These systems involve the monitoring of weather patterns and sharing information within the community to prompt timely responses, such as the relocation of livestock or preparedness for drought.

Recognizing the risks associated with dependence on a single livelihood source, some community members in Mandera have diversified their income-generating activities. This includes small-scale agriculture, trade, and non-farm activities to reduce vulnerability to climate-induced shocks.

To combat soil erosion and improve soil fertility, communities engage in agroforestry practices by planting drought-resistant tree species and employing soil conservation techniques like terracing and mulching.

NGOs and government agencies have partnered with local communities to enhance their knowledge and skills related to climate adaptation. These initiatives include training in sustainable agricultural practices, climate-smart livestock management, and disaster risk reduction.

Various community-based adaptation projects have been initiated in Mandera County, often with the support of international organizations, local NGOs and government agencies. These projects include the construction of irrigation systems, provision of drought-resistant seeds, and the promotion of climate-resilient farming techniques.

Some community groups and organizations in Mandera County engage in advocacy efforts to raise awareness about climate change and its impacts on their livelihoods. They work to influence local and national policies to ensure that climate adaptation is prioritized in government planning and resource allocation.

Grassroots Climate change institutions such as the Ward climate change planning committees spearhead awareness creation on climate change risks, their impacts and adaptation/mitigation measures at the village and ward levels.

4.2 Effectiveness of adaptation/Resilience strategies

The Local communities in collaboration with various stakeholders such as County government, National government agencies, Development partners, NGOs, FBOs and CBOs are undertaking an array of adaptation/resilience strategies to address impacts posed climatic hazards including but not limited shortage of pasture, scarcity of water, environmental degradation, crop failures and loss of livelihoods.

The effectiveness these adaptation and resilience strategies vary depending on various factors, including the specific strategies implemented, the severity of the hazard, level of community engagement, available resources, and the monitoring and evaluation mechanisms in place.

This section looks at how effective these adaptation and resilience strategies are and whether they will help communities cope with the climate induced hazards and build sustainable and thriving livelihoods.

The ranking to determine the effectiveness of the strategies were done at community level during the ward level community consultations using local response tool. The same was done during the multi-stakeholder workshop where the stakeholder representatives gave their inputs on the level of effectiveness of the various strategies employed against the climate hazards.

Table 5: Effectiveness of Adaptation Strategies

Hazard	Impact	Local response	Effectiveness	Sustainability	What would make them more effective	Gender and Social Inclusion information
Drought	Loss of livestock	Local feeding using roots (*andad*)	++	0	Adopt irrigation for pasture production	Mainstream gender equality & social inclusion
		Purchase of animal feeds (hay)	++	0		
	Crop failure	Purchase of food from the market	++	0	Adopt climate-smart agriculture / irrigated farming	
	Conflict over resources	Community-based conflict resolution (*Maslaha*)	+++	+++	Supporting community-based models	
	Loss of income and savings	Credit within the community	+++	++	Financial assistance & mainstreaming savings associations	
	Water scarcity	Local water trucking	++	0	Construction of multipurpose mega-dams	
Attacks from wild animals	Loss of livestock, attacks on people, and damage to crops in farmlands	Local fencing	+	0	Strategic demarcation of game parks/ game reserves	Mainstream gender equality & social inclusion
		Scaring wild animals away (scarecrows, and lighting fires,)	++	0	Mainstreaming wildlife protection measures	
		Trapping wild animals	+	0		

Pests & Diseases	Loss of livestock	Traditional/ local veterinary treatment	++	0	Upscale vaccination drives and veterinary services	Mainstream gender equality & social inclusion
		Local isolation/ quarantine of affected or infected livestock	+	0		
	Crop failure due to invasion of locusts and fall-armyworms	Purchasing and spraying of agrochemicals	+++	+	Mainstream climate-smart agricultural production technologies	
		Buying of hybrid or disease-resistant certified seeds and seedlings	++	+		
	Loss of income	Credit from the community, savings, or merry-go-rounds	++	0	Financial assistance & mainstreaming savings associations	

Key.

+++ ---------- Very High

++ ---------- High

+ ---------- Medium

0 ---------- Not effective/Not sustainable

CHAPTER 5: SECTOR STRATEGIC PRIORITY AREAS

The adaptation strategies aim to address climate hazards prioritized during the ward level community consultation and multi-stakeholder workshop of the participatory climate risk assessment for Mandera County and their impacts on local communities. As the county faces increased climate variability and extreme weather events, it is crucial to develop effective strategies that empower these communities and build their resilience.

This chapter explores a range of adaptation measures, encompassing both traditional knowledge and innovative approaches, to enhance the county's capacity to cope with climate-related risks. By engaging stakeholders and incorporating their perspectives, this participatory assessment strives to foster inclusive decision-making and create a pathway towards a more sustainable and climate-resilient future for the county. The strategies are captured under the four sectors of water, Agriculture, Environment and Disaster management.

Table 6: Strategic Priority Areas Summary

Drought				
Sector	**Risk**	**Stressor/shock/cause/what is behind the risk**	**Adaptation strategies**	**Wards**
Water	Reduced water availability Depletion of groundwater resources Water scarcity for human and livestock consumption	Decreased rainfall, prolonged dry seasons	• Construction of water harvesting and storage structures. • Drilling and rehabilitation of strategic boreholes • Desilting and expansion of major water pans. • Water treatment, • desalination of borehole water and distribution/ supply network to households • Construction of more community water storage tanks. • Community education and awareness creation on water harvesting, conservation and sustainable consumption of water.	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara.
Agriculture	Crop failure and reduced yields Livestock deaths due to lack of food and water Soil erosion and desertification	Insufficient water for irrigation, soil erosion	• Ecosystem conservation, restoration and protection of water catchment through afforestation, reseeding of indigenous tree species.	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale,

			• Support community policing on environmental management and conservation. • Integrating Indigenous and scientific knowledge on climate information systems. • Adoption of renewable energy as an alternative to fuel wood to curb deforestation. • Awareness creation on the importance of afforestation through public barazas, environmental clubs, community dialogue and community groups • Restriction of haphazard (mushrooming)settlement on rangeland through involving political leaders that deprives rangeland from its tree resources • Supporting community rangeland resource user groups i.e gum and resin, beekeeping, through registration and providing working materials.	, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara

Environment	Loss of biodiversity Deforestation and land degradation Displacement of wildlife	Desertification, loss of biodiversity	• Increasing fodder farming such as Napier and Sudan grass. • Provision of farming inputs le.g., certified drought-resistant crop seeds, farm tools & equipment. • Enhanced agricultural productivity through investment in climate smart Agriculture. • Upscaling of livestock off-take program. • Large Scale production and storage of hay and feed supplements. • Construction of feedlot. • Crop Diversification. • Promotion of small-scale Irrigation system. • Diversification of livelihoods • Livestock insurance and compensation for loss of livestock. • Restocking with improved livestock breeds. • Construction of mega-dam for irrigation	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara

			• Pre-position adequate veterinary drugs and vaccine	
Disaster Management	Increased competition for resources leading to conflicts Human displacement and migration Strain on relief resources	Decreased rainfall, prolonged dry seasons	• Up-scaling emergency food assistance/ cash transfers. • Capacity building (financial support/ empowerment) of women, youth, VMGs, and PLWDs. • Enhancing collaboration among state and non-state actors. • Establishment disaster response committees at sub-county/Ward Level	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither Dandu, Takaba town, Lagsure, Takaba south, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara
Floods				
Water	Contamination of water sources Water Infrastructure damage Disruption of water supply system	Pollution from flooding, sewage overflow	• Construction, expansion and desilting of water pans. • Enhancing water harvesting and storage technologies. • Channeling of surface runoff waters to water point-dams. • Conservation of water catchment areas.	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara.
Agriculture	Crop damage and loss Soil erosion and nutrient depletion	Soil erosion, waterlogging, seed destruction	• Construction of flood control structures e.g.	Neboi, Township, Khalalio, Libehiya, sala, Rhamu, Rhamu dimtu, Banisa,

	Livestock fatalities		dykes and gabions along lagas.and the river • Planting of cover crops and Promotion of Agro forestry. • Regulation of farming system by enforcing 30-meter riparian rule. • Crop insurance	Kiliweheri, Malkamari, Dandu, Takaba , Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara
Environment	Habitat destruction and loss of biodiversity Pollution from agricultural runoff Displacement of wildlife	Loss of wildlife habitats, disruption of ecosystems	• Soil erosion control techniques such as tree planting, gabions, terracing, diversion to main laggas and valleys. • Demarcation of riparian land and conservation through planting of tree spp such as bamboo vetiver grass, and other local bank conservation spp. • Public awareness to communities on the dangers of floods (i.e moving to higher grounds, unblocking of all water courses, restriction on encroachment to the water flood prone areas) • Proper solid waste management	Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Wargudud, Alungu, Lafey, fino, Warankara

Disaster Management	Flood-related injuries and casualties Damage to homes and infrastructure Displacement of communities	Roads, bridges, and buildings destruction	• Provision of Early warning systems for information dissemination. • Improve drainage systems in urban areas. • Proper maintenance of roads, drifts, bridges. • Provision of non-food items to affected communities. • Capacity enhancement of communities on flood control techniques. • Develop framework for sharing disaster risk information up to community level. • Dissemination of disaster risk information through local media. • Establishment of County GIS Lab and GIS unit to provide data on flood risky areas.	Township, Takaba, Takaba south, Lagsure, Kutulo, Neboi, Khalalio, Libehiya, Arabia, Fino, Dandu, Rhamu, Rhamu Dimtu,
• **Pests**				
Agriculture	Crop destruction reduced yields Livestock diseases Deaths Economic losses.	Pest infestation, destruction of crops	• Construction of flood control structures e.g., dykes and gabions along lagas and the river.	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri,

			• Planting of cover crops and Promotion of Agro-forestry • Regulation of farming system by enforcing 30-meter riparian rule. • Crop insurance • Establishment of livestock disease-free zone areas • Vaccination drives/ mobile clinics for veterinary services. • Adoption of disease resistant crop and livestock varieties. • Enhancing livestock extension service • Establishing and implementation of Integrated Pest Management System (IPM). • Establishment of Agro-veterinary drug stores. • Developing and implementing of early warning systems for disease outbreaks. • Diversification of crops and livestock.	Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara

			• Strengthening disease surveillance and monitoring systems. • Capacity building of local communities, healthcare workers, and veterinary professionals on disease identification, prevention and control measures. • Provision of farm inputs including agro-chemicals, certified seeds, supplemental feeds. • Construction of slaughterhouse, dumpsite, and provision of exhauster services. • Provision of mineral supplements to manage deficiencies. • Equipping and operationalization of veterinary diagnostic lab in Mandera East.	
Environment	Disruption of natural ecosystems Imbalance in predator-prey relationships. Loss of native plant species	Pesticides affecting non-target organisms	• Sensitization and awareness creation to communities on the dangers of pest and diseases to human and animal lives as well as vegetation and agriculture.	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma

			• Growing of pest and disease resistant crops. • Practice good garden hygiene and draining of stagnant waters	
Disaster Management	Increased demand for pest control measures. Economic strain on agricultural sectors. Food security concerns	Reduced agricultural revenue. increased expenses	• Provision of water treatment inputs. • Provide emergency pest control measures. • Increase the number of community health workers	Khalalio, Libehiya, Arabia, sala, Rhamu dimtu, Guticha, Morothile, Ashabito, Guba, Derkale, Kiliweheri, Malkamari, Gither, Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma
Heatwaves				
Water	Increased evaporation rates Reduction in water quality. Stress on aquatic ecosystems	Increased evaporation, reduced water sources	• Enhance Water Conservation, • Upgrade Water Supply Infrastructure, • Implement Water-Efficient Technologies	Neboi, Township, Khalalio, Libehiya, Arabia, sala, Rhamu, Rhamu dimtu, Guticha, Morothile, Ashabito, Banisa, Guba, Derkale, Kiliweheri, Malkamari, Gither Dandu, Takaba, Lagsure, Takaba south, Shimbir Fatuma, Kutulo, Elwak North, Elwak South, Wargudud, Alungu, Lafey, fino, Warankara
Agriculture	Crop wilting and reduced yields Increased irrigation demands. Livestock heat stress and decreased productivity	Heat stress on crops, insufficient water supply	• Develop Heat-Resistant Crop Varieties, • Improve Irrigation Efficiency, • Adopt Agroforestry Practices	

Environment	Loss of biodiversity in sensitive ecosystems Changes in migration patterns.	Heat stress on humans, plants and animals, habitat loss.	• Promote afforestation & Conservation programmes, • Create Shaded Areas for Wildlife. Reduce Urban Heat Islands.	
Disaster Management	Health impacts (heat-related illnesses. Strain on healthcare systems. Energy demand for cooling systems	Increased heat-related illnesses, strain on healthcare	• Carry Public Health Campaigns. • Establish Heat-Resilient. Infrastructure. • Early Warning Systems. • Adoption of renewable energy.	

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

Through the participatory climate risk assessment, Mandera County has gained a deeper understanding of the climate hazards prevalent across the county. These risks were found to be drought, floods, pest and diseases and resource conflicts which are having huge impacts, particularly in relation to extreme weather events, water scarcity, food security, and environmental degradation. The involvement of local communities has provided essential insights and local knowledge, ensuring that the assessment captures the unique perspectives and experiences of those most affected.

The outcomes of the participatory climate risk assessment will enable the National, county government and relevant stakeholders to develop informed strategies, actions to build resilience and adapt to the changing climate. The identification of priority areas, such as water resource management, agriculture, infrastructure, and disaster risk reduction, will guide the allocation of resources and implementation of targeted interventions to address the identified risks.

Moreover, the participatory approach will foster ownership and empowerment among local communities, encouraging their active involvement in climate change adaptation and mitigation efforts. By including their voices and perspectives, the county has promoted a sense of community resilience and collective responsibility, ensuring that the interventions and policies are contextually appropriate and sustainable.

Furthermore, the participatory climate risk assessment will facilitate collaboration and coordination among various stakeholders. Government agencies, NGOs, and community-based organizations who will work together, share knowledge, expertise, and resources to implement climate-resilient solutions. This multi-stakeholder engagement will not only enhance the effectiveness of the interventions but also foster partnerships and strengthen the overall climate governance framework in the county.

However, it is important to acknowledge that the participatory climate risk assessment is an ongoing process. As climate change continues to evolve, regular reassessment and updates will be necessary to account for new risks, emerging vulnerabilities, and changing priorities. Continued engagement with local communities and stakeholders will ensure that the strategies and actions remain relevant, responsive, and sustainable.

During the PCRA exercise, the following challenges were encountered.

- Mandera County often lack comprehensive and up-to-date climate data due to limited monitoring infrastructure and resources. This made it challenging to gather accurate historical climate data for analysis and projections, which are essential for assessing climate risks.
- As the resources and time could allow, the PCRA exercise was done at ward level and not at village level. This has limited the representation of different communities and their perspectives in the assessment. Additionally, logistics and travel constraints can pose challenges for fieldwork and data collection.
- Mandera County faces socio-economic challenges, including limited access to education and resources. The exercise required building capacity and raising awareness among the local communities to acquire meaningful participation and understanding of climate change risks.
- Different members of the community have competing interests and priorities, such as water scarcity, land management, and livelihood concerns. Balancing these interests and ensuring that the climate risk assessment aligns with local priorities was a challenge.
- Some individuals within the community were skeptical about climate change and its impacts. Overcoming skepticism and building trust among stakeholders are crucial for effective participation and successful implementation of the climate risk assessment.

These PCRA report recommends the following:

1) Development of a climate change action plan to provide an implementation framework for the proposed adaptation strategies over the next 5 years. The action plan should focus on addressing the most common climate risks as identified in chapter two. These include prolonged drought, floods, pests and diseases and loss of biodiversity.
2) All stakeholders to support the county government in implementing the priority actions identified in the plan which should be updated from time to time to enhance accounting for new risks, emerging vulnerabilities, and changing priorities.
3) Capacity building of key players in the implementation of climate action should be undertaken, these includes: capacity should be strengthened in order to facilitate mainstreaming of climate action across the sectors. This should be accompanied by increase capacity to track and monitor climate finances across various sectors in the county.
4) Conduct awareness campaigns and capacity building programs to educate communities and key players on climate change, its impacts, and adaptation strategies. This should include strengthening the capacity of the County Climate Change Unit (CCU) to effectively coordinate and monitor the implementation of prioritized climate change actions, enhance capacity of the

County Climate Change Planning Committee and Steering for informed decision making across all sectors and Capacity building of the Ward Climate Change Planning Committees to enable effective community-centred climate change risk assessment and action planning. There should be deliberate effort Promote climate literacy in schools and support local initiatives that raise awareness about sustainable practices.

5) Improvement should be made in the collection and analysis of climate data, including rainfall patterns, temperature trends, and extreme weather events. This data will help in understanding local climate risks and developing appropriate adaptation strategies.
6) Enhance the capacity of early warning systems to provide timely and accurate information about impending climate-related hazards, such as floods, drought and heat waves. This will enable communities to take proactive measures and reduce vulnerability.
7) Encourage the adoption of climate-resilient agricultural practices, such as agroforestry, conservation farming, and improved irrigation techniques. Promote the use of drought-resistant crop varieties and diversify agricultural activities to enhance food security and reduce the dependency on rain-fed agriculture.
8) Enhancement of water storage and management infrastructure, including dams, reservoirs, and water harvesting techniques. Promote efficient water use practices in agriculture, households, and industries. Explore opportunities for groundwater recharge and explore alternative water sources.

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4. Republic of Kenya, (2018), National Climate Change Action Plan (Kenya) 2018-2022.
5. Republic of Kenya, (2016): National Climate Change Adaptation Plan 2015 -2030
6. Participatory Climate Risk Assessment guidelines
7. The Climate Change Act, 2016 (No. 11 of 2016)
8. The Mandera County Climate Change Fund Act 2021
9. The Mandera County Climate Change Adaptation Policy, 2021

ANNEXES

Annex 1: ***Mandera County fact sheet***

Information Category		**County Statistics (as at 2022)**	**National Statistics (as at 2022)**
County Area:			
Total area (Km^2)		25,991.5 km^2	580,895
Non-arable land (Km^2)		20,514.19 km^2	304,595
Arable land (Km^2)		5477.31 km^2	276,300
Size of gazetted forests (Ha)		16,866	2,585,526.44
Size of non-gazetted forests (Ha)		1240	-
Approximate forest cover (%)		3.04%	8.8
Water mass (Km^2)		No data	
No. of rivers, lakes and wetlands protected		1	
Total urban areas (Km^2)		170 km^2	
No. of quarry sites rehabilitated		3	-
No. of climate change adaptation projects/programmes		10	-
Topography And Climate			
Lowest altitude (metres)		200m	
Highest (metres)		970m	
Temperature range:	High ^0C	42 ^0C	
	Low ^0C	24 ^0C	
Rainfall	Average rainfall	255mm	
Average relative humidity (%)		55%	
Wind speed (Kilometres per hour/knots)		9.9	
Demographic Profiles			
Total population		935,253	56807211
Total Male population		459,277	28373750
Total Female population		475,976	28433461
Total intersex Population		37	
Sex ratio (Male: Female)		96.49	998:1000
Projected Population	Mid of plan period (2025)	1,007,207	
Total number of households		125,763	
Average household size		6.9	
Number of PWDs	Visual	1736	
	Hearing	2538	
	Speech	1486	
	Physical	2525	

	Mental	2186	
	Other	3103	
	Total	13574	
Poverty Indicators			
Absolute poverty (%)		77.3	36.1
Rural poor (%)			49.1
Food poverty (%)		61.9	32
Contribution to National Poverty (%)			
Health			
Five most common diseases (in order of prevalence)		Upper respiratory infection	
		Urinary Tract infection	
		Diarrhea	
		Diseases of the Skin	
		Ear Infections	
Infant Mortality Rate (IMR)/1000		41.3/1000	
Neo-Natal Mortality Rate (NNMR)/1000		*	
Maternal Mortality Rate (MMR/100,000)		385/100,000	
Post Neo-Natal Mortality Rate (PNNMR)/1000		21.1/1000	
Child Mortality Rate (CMR)/1000		*	
Under Five Mortality Rate (U5MR)/1000		63.5/1000	
Prevalence of stunting (Height for Age)		14.2	
Prevalence of wasting (Weight for Height)		28.8	
Prevalence of underweight (Weight for Age)		26.1	
Life expectancy	Male	57.3	
	Female	60.5	
HIV prevalence (%)		0.3	
Patients on ARVs (No.)		831	
Average Distance to Health facility (km)		50	
Antenatal Care (ANC) (%)		56	
Health Facility Deliveries (%)		73	
Registered traditional herbalists and medicine-men (No.)		-	
Contraceptive use by women of reproductive age (15-49 yrs) (%)		8.8	
Immunization coverage (%)		81	
CHVs (No.)		280	
Crude Birth rate		49.4/1000	
Crude death rate		9.1/1000	
Agriculture, Livestock & Fisheries			
Crop Farming			
Average farm size (Small scale) (acres)		2.5 acres	
Average farm size (Large scale) (acres)		12.5acres	
Main Crops Produced			
Food crops (list)		Onions, watermelons,	

		tomatoes, capsicum, bananas, mangoes, pawpaws, kales, spinach, pepper, lime, lemons, guavas, maize, sorghum, cowpeas, green grams , simsim, sunflower and fodder-Sudan grass	
Cash crops (list)		**Nil**	
Total acreage under food crops (acres)		20,725	
Total acreage under cash crops (acres)		0	
Main storage facilities (Maize cribs, store and warehouses)		1.NCPB Stores Mandera depot 2 main stores each 4500MTand 2 rubhall tents each 500MT capacity 2. MCG warehouse at Shashafey 7,500MT capacity 3. Private godowns in Mandera 4,500MT capacity 4. Elwak has several warehouses with capacity to store 1,800MT 5. Takaba, Rhamu and Banisa towns have privately owned premises which can be rented. 6. At household level we have stores, cribs and hay stores countywide.	
Extension officer farmer ratio		1:1,566	
Livestock Farming			
Number of livestock	Dairy Cattle	58	
	Beef Cattle	841,530	
	Goats	3,102,381	
	Sheep	1,051,164	
	Camel	997,650	
	Donkey	184,025	
	Poultry	68,529	
Number of Ranches		0	
Extension officer famer ratio		1:9000	
Irrigation Infrastructure			
Irrigation schemes	Small (<5 Acres)	403	
	Large (>5 Acres)	8	
Type of Livestock, Population and Value			
Dairy cattle	Quantity (Total Population)	58	

	Value (Kshs.)	4,640,000	
Beef cattle	Quantity (Total Population)	841,530	
	Value (Kshs.)	25,245,900,000	
Goat	Quantity (Total Population)	3,102,381	
	Value (Kshs.)	12,409,524,000	
Sheep	Quantity (Total Population)	1,051,164	
	Value (Kshs.)	3,153,492,000	
Camel	Quantity (Total Population)	997,650	
	Value (Kshs.)	49,882,500,000	
Chicken	Quantity	68,529	
	Value (Kshs.)	54,823,200	
Beehives		32,187	
Livestock Products and Their Value (Annual)			
Milk	Quantity (kg.)	703,731,840	
	Value (Kshs.)	56,300,635,200	
Beef(Cattle)	Quantity (Kgs)	58,907,100	
	Value (Kshs.)	23,562,840,000	
Beef(Camel)	Quantity (Kgs)	149,647,500	
	Value (Kshs.)	59,859,000,000	
Chevon	Quantity (Kgs)	31,023,810	
	Value (Kshs.)	15,511,905,000	
Mutton	Quantity (Kgs)	7,358,148	
	Value (Kshs.)	2,943,259,200	
Chicken meat	Quantity (Kgs)	102,793	
	Value (Kshs.)	92,513,700	
Honey	Quantity (Kg.)	450,618	
	Value (Kshs.)	225,309,000	
Hides	Quantity (kg.)	1,843,200	
	Value (Kshs.)	92,160,000	
Eggs	Quantity (Trays)	9,868,176	
	Value (Kshs.)	98,681,760	
Fisheries			
Fish traders (No.)		14	
Fish farm families (No.)		33	
Fish ponds (No.)		41	
Fish Tanks (No.)		6	
Area of fish ponds (m^2)		12,300	
Main species of fish catch (list with tonnage)		Tilapia, Cat Fish. 450kgs on daily basis	
Fishing nets (No.)		28	

No. of fish landing sites		0	
No. of Beach Management Units		2	
Oil And Mineral Resources			
Mineral and Oil potential (explain)			
Ongoing mining and extraction activities (Quarry, sand harvesting, cement etc.)			
Forestry			
No. of gazetted forests		0	
No. of non-gazetted forests		0	
No. of community forests		2	
Main forest products (Timber, fuel and poles)			
Forestry products' value chain development			
Incidences of environmental threats (Loss of biodiversity, drought, floods, Forest fires, Deforestation)			
No. of people engaged in forestry		39	
Seedling production	Forest Nurseries (No. of seedlings)	100,000	
	Private Nurseries (No. of seedlings)	10,000	
Quantity of timber produced(m^3)		0	
Education And Training			
Pre-Primary School			
No. of ECD centres		311	
No. of ECD teachers		410	
Teacher/pupil ratio		1:60	
Total Enrolment	Girls	10443	
	Boys	14309	
Average years of attendance (years)		5	
Primary Schools			
Number of primary schools		312	
Number of teachers		926	
Teacher/pupil ratio		1:132	
Total enrolment	Boys	76917	
	Girls	45726	
Dropout rate %		20%	
Enrolment rate %		70%	
Retention rate %		80%	
Proportion of community nearest to public primary school	0 – 1Km	10%	
	1.1 – 4.9Km	80%	
	5Km and more	10%	

Special Needs Schools			
Number of Special Needs Schools		2	
No. of Integrated Schools		68	
Number of teachers		*	
Teacher/pupil ratio		*	
Total enrolment	Boys	1323	
	Girls	950	
Dropout rate %		2%	
Enrolment rate %		25%	
Retention rate %		98%	
Secondary Schools			
Number of secondary schools		59	
Number of teachers		526	
Teacher/student ratio		1:33	
Total enrolment	Boys	11515	
	Girls	6089	
Dropout rate %		40%	
Enrolment rate %		80%	
Retention rate %		60%	
Proportion of community nearest to public secondary school	0 – 1Km		
	1.1 – 4.9Km		
	5Km and more		
Vocational Training Centres	No.	7	
	Enrolment	492	
	Attendance		
Tertiary Education (accredited public and private)	No. of TVETS	9	
	No. of universities	0	
	Enrolment (desegregate by sex)	Male(175) Female(317)	
	Attendance	3422	
Adult Literacy	Number of adult literacy centres	9	
	Enrolment	3422	
	Attendance		
Literacy rate (%)	Male	20%	
	Female	10%	
	Total	30%	
Ability to read	Can read (%)	30%	
	Cannot read (%)	70%	
Ability to write	Can write (%)	30%	
	Cannot write (%)	70%	
Ability to read and write	Can read and write (%)	30%	

	Cannot read and write (%)	70%	
Percentage of schools with access to:	Electricity		
	Internet		
	Computers		
Tourism And Wildlife			
Hotels by category (No.)	Five star	0	
	Four star	7	
	Three star		
	Two star		
	One star		
	Unclassified		
Hotel bed capacity by category (No.)	Five star	0	
	Four star		
	Three star		
	Two star		
	One star		
	Unclassified		
Animal Types ((No.)	Elephants	0	
	Rhino	0	
	Lion	0	
	Leopards	0	
	Others		
Number of Wildlife Conservation Areas (No.)	Game parks	0	
	Reserves	1	
	Conservancies	5	
	Game ranches	0	
Number of tourists visiting attraction sites, annually (No.)	Domestic		
	Foreign		
Museums (list)			
Heritage and Cultural sites (No.)	1		
Social amenities			
Talent Academies (No.)		0	
Sports stadia (No.)		1	
Libraries /information documentation centres (No.)		1	
Social halls/Recreation Centres (No)		7	
Public Parks (No)		0	
Environmental Management			
Volume of solid waste generated: Daily/Annual			
Volume of solid waste collected & Disposed: Daily/Annual			
Proportion of waste recycled			
No. of Material Recovery Facilities			
No. of Waste Management Facilities			

Water And Sanitation			
Households with access to piped water (No.)		24,300	
Households with access to portable water (No.)		814,203	
Permanent rivers (No.)		1	
Shallow wells (No.)		22	
Protected springs (No.)		0	
Un-protected springs (No.)		0	
Water pans (No.)		235	
Dams (No.)		47	
Boreholes (No.)		218	
Distribution of Households by Main Source of water (%)	Piped into dwelling	0.4	10.1
	Piped	11	14.1
	Rain/harvested	2	3.9
	Borehole	54	9.9
	Protected well	0.5	7.0
	Protected spring	0	7.1
	Unprotected well	0	2.6
	Unprotected spring	0	2.4
	Stream	0	16.8
	Water Vendor	0	8.5
	Dam/lake	28	3.3
	Pond	0	1.6
Water supply schemes (No.)		174	
Average distance to nearest water point (km)		9.8	
Households distribution by time taken (minutes, one way) to fetch drinking water:	0	11	
	1-4	1	
	5-14	3	
	15-29	39	
	30-59	28	
	60+	2	
No. of Water Resource User Associations (WRUA) Established		7	
Households with latrines (percent)	Flush toilet	12	
	VIP Latrine	35	
	Uncovered Pit Latrine	49.8	
	Bucket	0	
	None	3.2	
Community distribution by type of waste/garbage disposal (percent):	Collected by local Authority	25	
	Collected by Private firm	0	
	Garbage pit	3	
	Burning	60	
	Public garbage heap	9	
	Farm Garden	0	

	Neighborhood Community group	3	
Energy			
Households with electricity connection (prop.)		35%	
% of trading centres connected with electricity			
HHs distribution by main cooking fuel	Electricity	1.6%(123,935)	0.8%(12,040,701HHs)
	Gas (LPG)	0.4	23.9
	Biogas	0.4	0.5
	Solar	0.5	0.2
	Paraffin	0.3	7.8
	Firewood	86.4	55.2
	Charcoal	10.4	11.6
HHs distribution by main lighting fuel	Electricity	15.7	50.4
	Gas (LPG)	2.6	0.2
	Biogas	0.0	0
	Solar	9.9	19.3
	Paraffin	0.5	6.6
	Tin lamp	1.0	9.6
	Fuel wood	26.8	2.8
Housing			
Type of Housing	Permanent (%)		
	Semi-permanent (%)		
Roofing material	Iron Sheets (%)	42.2	80.3
	Grass thatched (%)	43.1	5.1
	Tiles (%)	0.2	1.0
Housing wall	Bricks (%)	5.4	10.2
	Mason stones (%)	6.7	16.5
	Mud (%)	10.1	27.2
Floor type	Cement (%)	13	43.7
	Earthen (%)	78.6	30.0
	Clay (%)	3.1	13.7
Infrastructure			
Road Length			
Bitumen surface (km)		25.5	170
Gravel surface (km)		1705	400
Earth surface (km)		670	200
Railway line (km)		0	0
Railway stations (No.)		0	0
Major bus parks (No.)		0	0
Lorry parks (No.)		0	0
Operational Airports (No.)		0	0
Operational Airstrips (No.)		5	2
Trade And Industry			
Trading centres (with >2000 population) (No.)		19	
Registered retail traders (No.)		4000	

Registered wholesale traders (No.)	2500	
Jua kali Associations (No.)	8	
Major industries (No.)	10	
Micro, Small and Medium Enterprise (No.)	4500	
Flood lights/street lights (No.)	10	
No of Market Stalls	776	
Disaster Management		
Fire engines (No)	3	
Fire stations (No)	1	
Fire fighters (No)	27	
Ambulance (No)	13	

Source: Mandera County Department of Economic Planning, 2022

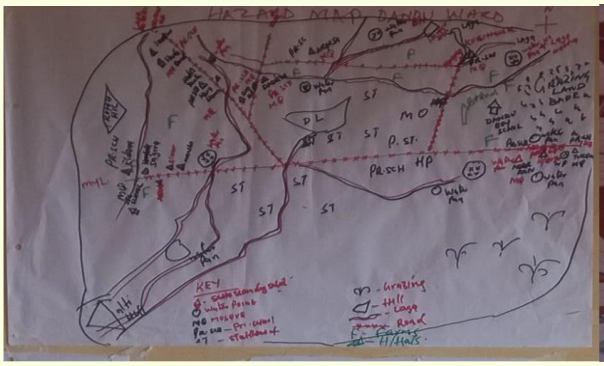
Annex 2: ***PCRA Ward-Level engagement photos***



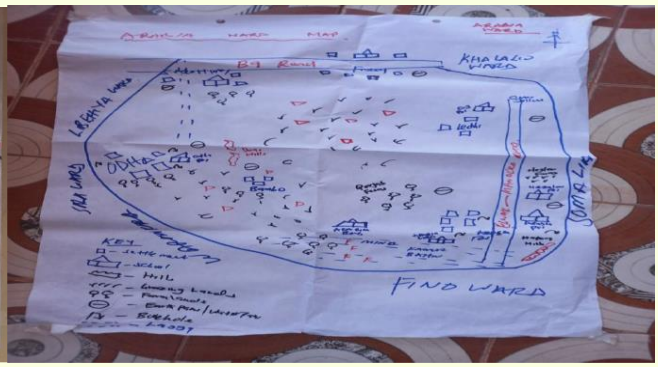




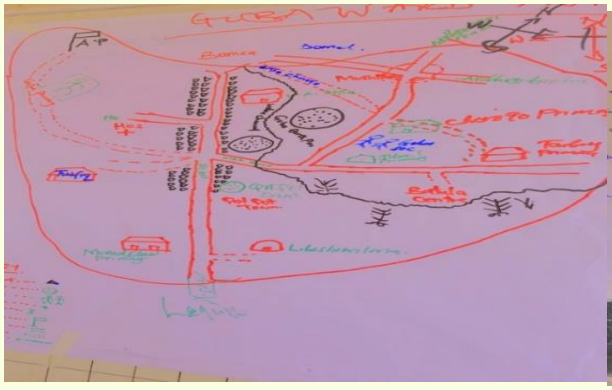
Annex 3: Sample ward-level Community Hazard Maps



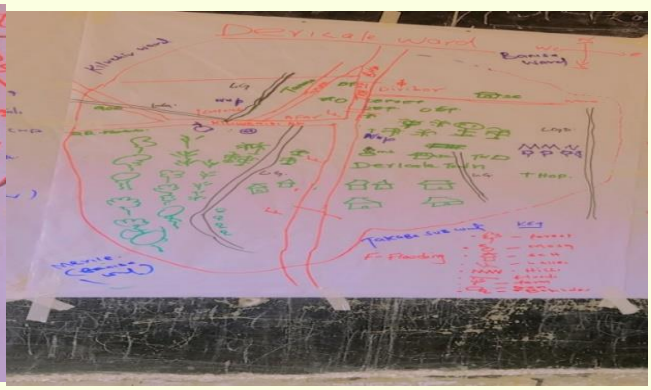
Dandu ward



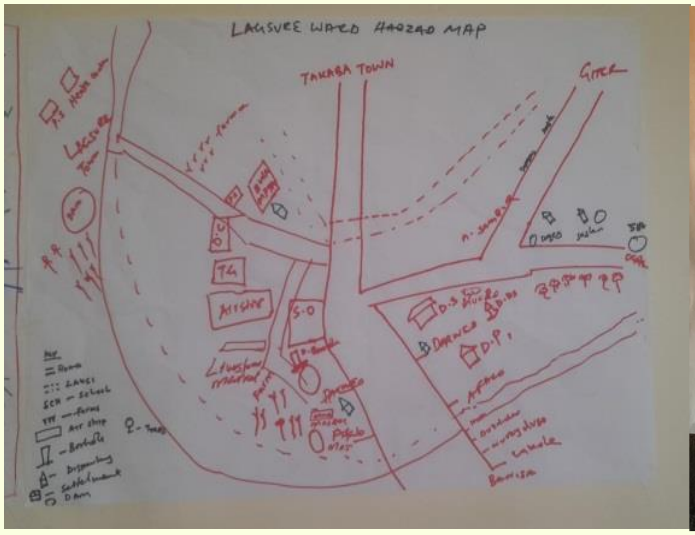
Arabia Ward



Derkale ward



Guba ward



Lagsure Ward

Khalalio Ward

Annex 4: Mandera County PCRA and CCCAP Road map

MANDERA COUNTY PCRA AND CCCAP ROADMAP															
PHASE 1 PCRA	**ACTIVITIES**	Week 1 Mar 6-Mar 12	Week 2 Mar 13-Mar 19	Week 1 Mar 20-Mar26	Week 2 Mar 27-Apr 2	Week 3 Apr3-Apr 9	Week 4 Apr 10-Apr 16	Week 5 Apr 17-Apr23	Week 6 Apr 24-Apr 30	Week 7 May 1-May 7	Week 8 May 8-May 14	Week 9 May 15-May 21	Week 10 May 22-May 28	Week 12 May 29-June 4	Remarks
	Consultative meeting with directors of technical departments and County Coordinators of Relevant National Government Agencies														Completed
	Formation of County Climate Change Technical Coordination Committee														Completed
	Formation of cross-sectoral county Technical Working Group.														Completed
	Training of TWGs on Participatory Climate risk Assessments (PCRA)														Completed
	Stakeholder analysis and identification meeting														Completed
	Preparation for Ward-level community engagement and data collection for PCRA														Completed
	Ward-level community engagement and data collection for PCRA														Completed
	Consolidation of ward-based PCRA reports into sub-county														Completed
	Consolidation of Sub-County PCRA reports into County PCRA Draft Report														Completed
	Multi-stakeholder Engagement workshop on participatory Climate Risk Assessment.														Completed
	Preparation of the final PCRA Report														Completed
	Publication of PCRA Report														Completed
Phase 2 Development of CCCAP	Review of Key Documents and Collecting Public input														Completed
	Preparation of draft County Climate Change Action Plan														Completed
	Conducting CCCAP public participation														Completed
	Development of 2nd CCCAP Draft														Completed
	CCCAP validation workshop														Completed
	Development of final CCCAP														Completed
	Presentation of CCCAP to county executive committee and County Assembly for adoption														Completed
	Publishing and Launching of the CCCAP														Completed

Annex 5: Multi-stakeholder workshop attendance list

REPUBLIC OF KENYA

Financing Locally-Led Climate Action (FLLoCA) Program

MANDERA COUNTY GOVERNMENT
MINISTRY OF WATER, ENERGY, ENVIRONMENT, NATURAL RESOURCES & CLIMATE CHANGE
DEPARTMENT OF ENVIRONMENT AND CLIMATE CHANGE

ACTIVITY: MANDERA COUNTY PARTICIPATORY CLIMATE RISK ASSESSMENT REPORT AND COUNTY CLIMATE CHANGE ACTION PLAN VALIDATION MULTI-STAKEHOLDER WORKSHOP

VENUE GRANADA HOTEL DATE 27TH MAY 2023

S/No	Name	ID	Mobile number	Gender		People living with disability (yes/ no)		Age 18-35 35-60 Above 60	signature
				Male	Female	Yes	No		
1.	Abdisalam mohamed Nurow	29462332	0700246009	✓			✓	18-35	[illegible]
2.	Abdirahman Maalim Hussein	33208386	0728363732	✓			✓	18-35	[illegible]
3.	Mohamed Abubakar	25094470	0704627295	✓			✓	35-60	[illegible]
4.	Basra Hussein Issack	28975521	0711794205		✓		✓	18-35	[illegible]
5.	Tajudin Abdikadir	28016059	0725590222	✓			✓	18-35	[illegible]
6.	Saadia Adan Mohamed	25313826	0728589926		✓		✓	35-60	[illegible]
7.	ISSACK M. NJOROGE	10671829	0721834105	✓		[illegible]	✓	50+	[illegible]
8.	HUSSEIN MADEY ADAN	21139903	0724675849	✓			✓	35-60	[illegible]
9.	Bernard Omondi Oguk	10152103	0728866849	✓			✓	35-60	[illegible]
10.	Hassan H. Somo	11193754	0720619614	✓			✓	35-60	[illegible]
11.	Ismail Mugow Adaw	27904747	0721330734	✓			✓	18-35	[illegible]
12.	ADAN AHMED	35547888	0720738257	✓			✓	18-35	[illegible]
13.	Idris Yussuf Hassan	25549125	0727777923	✓			✓	18-35	[illegible]
14.	Issack Abdi Ali	26295446	0720433200	✓			✓	18-35	[illegible]
15.	Hawa Ibrahim	26258866	0758312253		✓		✓	18-35	[illegible]
16.	HALIMA HILLOW HASSAN	30614979	0746669707		✓			18-35	[illegible]
17.	Ayan Abdullahi Adan	36445605	0758583669		✓			18-35	[illegible]
18.	Mohamed Ali Olow	26267461	0722857104	✓			✓	35-60	[illegible]
19.	Abdirizack Ibrahim Hassan	24737426	0722166548	✓			✓	35-60	[illegible]
20.	Halima Diriye Nurow	6357143	0727331738		✓			35-60	[illegible]
21.	SIYAD AHMED MAALIM	32069536	0725009237	✓			✓	18-35	[illegible]
22.	Abdia Hussein Mohamed	13003795	0725236647		✓		✓	35-60	[illegible]
23.	Khaira Adan Nur	25297741	0725726607		✓			35-60	[illegible]
24.	Meymuna Adan Issack	26972577	0725726697		✓		✓	35-60	[illegible]
25.	Halima Hillow Hassan	30514979	0746667707		✓			35-60	[illegible]
26.	Fatuma Abdullahi Abdirahman	3[illegible]8	0711936857		✓	✓		35-60	[illegible]
27.	Khadija Ibrahim Moh	0019008	070344[illegible]		✓			60+	[illegible]
28.	Hibo Hassan Hali	23308813	0727799088		✓	✓		35-60	[illegible]

29	Majah Maalim Ibrahim	25827932	0726208251		✓	1	✓	35-60	[illegible]
30	Hassan Nur Robow	39240588	0723880278	✓				35-60	[illegible]
31	Omar Eymoy	13005971	0718968474	✓		✓		60+	[illegible]
32	Nuna Ali Bulle	22355582	0710358122		✓			35-60	[illegible]
33	Abdi Mohamed Osmar	25078711	0708383884	✓			✓	35-60	[illegible]
34	Habiba Jarma Gabur	1128332	0716832277		✓	✓		60+	[illegible]
35	Ali Hassan Mahat	27468448	0721504356	✓				35-60	A
36	Halima Billow Alio	8760651	0723402848		✓		✓	60+	[illegible]
37	Suban Maalim Issack	8760036	0743123683	[illegible]	✓		✓	35-60	[illegible]
38	Asli Adar Edin	25849903	0722585526	✓				35-60	[illegible]
39	Ibrahim Alio Hassan	0012174	0719383342	✓			✓	60+	Ib
40	Zamzam. Issak Ibra	39519816	0724377712		✓			18-35	[illegible]
41	Abdullah Markos	[illegible]	0722523377	✓				18-35	[illegible]
42	Osman Ali Dekeso	[illegible]	0724423618	✓			✓	60+	[illegible]
43	Bishara Mohamed	21669074	0712862711		✓	✓		35-60	[illegible]
44									
45									
46									
47									
48									
49									

Annex 6: Sample Questionnaire – Lafey Ward

LAFEY WARD

MANDERA COUNTY PARTICIPATORY CLIMATE RISK ASSESSMENT

COMMUNITY ENGAGEMENT TOOL.

Perspectives and experiences of past and current local weather and climate

- What have been the main threats/hazards facing the community in the last 20-30 years?
- Have you noticed changes in the climate over the last 10, 20-30 years? Explain.
- Have you noticed changes in frequency and intensity in the identified climate hazards over the last 10, 20-30 years? Explain (Seasonal calendar).
- How do these climate hazards affect you?
- Who in your community is most affected by these changes in climate and other hazards? What makes them especially vulnerable?
- Which assets or resources are most affected, and which are not affected? Explain.
- Where and how has the vulnerability of the community increased in recent years?

Adaptation and resilience strategies/ priorities

- How do members of the community traditionally deal with these problems?
- Do you think these responses are still effective? What would make them more effective? What can the government do to support these?
- Are any government programs helping the community to become more resilient to climate change? Which, why and how could they be improved?
- What actions would be needed to reach short term and long term resilience of communities against the identified priority Hazards/risks?
- What do you think would be the best strategies for building the resilience of local people to climate change? What is needed? What would be some of your priorities.

MANDERA COUNTY PARTICIPATORY CLIMATE RISK ASSESSMENT COMMUNITY ENGAGEMENT TOOL.

1. Climate change Hazard Analysis and Vulnerability Assessment

A. Information

Date:	County			Ward:
Facilitator:				Note taker:
Name (Participants)	Gender	Age		Institution/organization
		Below 35	Above 35	
1. Sharifa Abdi Guliye	F		✓	WCCPC member
2. Abdi Mohamud Osman	M		✓	VMG
3. Abdirahim Birik M.	M	✓		Ward admin
4. Abdullahi Mohamed	M	✓		Village admin
5. Katra Abdi Ibrahim	F	✓		Village admin
6. Shaaban Mohamud Muhumed	M	✓		Religious leader
7. Noor Mohamud Adan	M		✓	VMG
8. Abdirizack Mohamud Sheic	M		✓	PWD
9. Mohamed A. Saney	M		✓	Assistant chief.
10. Rukia Muhumed Haniye	F		✓	Women Group
11. Adey Ahmed Hassan	F		✓	Women Group.
12. Muhamed Jelle Ahmed	M	✓		YOUTH
13. Abdikadir Mohamed Ussaeic	M		✓	Elders
14. Ahad Adan Muhumed	M		✓	YOUTH
15. Ali Mohamed Ali	M		✓	Elderly
16. Abdullahi Hussein	M		✓	Sub-county livestock office
17. Kalbabi Sheikh Ahmed	M		✓	Ward Climate change [illegible]
18. Hassan Yunis Ali	M	✓		YOUTH
19. Abdirahman Subow Sheikh	M		✓	YOUTH
20.				

B. Main Findings of the exercise

- Have you noticed changes in the climate over the last 10,20-30 years? Explain.

Yes
- long dry periods
- high temperatures
- Scanty and erratic rainfall
- increased floods
- increased conflict over scarce resources
- low yield
- ~~[illegible]~~
-

MANDERA COUNTY PARTICIPATORY CLIMATE RISK ASSESSMENT COMMUNITY ENGAGEMENT TOOL.

- What have been the main threats/hazards facing the community in the last 10,20,30 years?

(1) Drought
(2) floods
(3) Diseases
(4) Conflict

- Have you noticed changes in frequency and intensity in the identified climate risks/hazards over the last 10.20-30 years? Explain (Using Seasonal calendar).

-> frequency and intensity of the droughts has been increasing over the past years.
-> rainfall periods have reduced with intense and frequent flooding
-> Increase diseases with high record of different types that is financially difficult to treat.

- Which are the 3 main/most threatening hazards affecting your region/Community? (Participants vote using the hazards identified to list 3 main hazards)

Prioritization

HARZARDS	SCORE	RANK
Drought	30	1
floods	11	3
Diseases	13	2
Conflict	6	4

- What have been the most important impacts of those hazards on the lives and livelihoods in your region?

(1) loss of life, disability, still birth, infant mortality and low fertility
(2) displacement, destruction infrastructure, inflation poor sanitation
(3) human and animal conflict, loss of property, reduced grazing land as movements is restricted during conflict.

- Who in your community is most affected by these changes in climate and other hazards? What makes them especially vulnerable

- children
- lactating, breast feeding and widow mothers
- old age persons. (financial & Physical support)

- lacks of support especially widows and orphan children.
-> being weakest in the community setup
-> lack of aid or minimal aid from the gov't ngos eg. the govt mostly targets unemployed youth.

MANDERA COUNTY PARTICIPATORY CLIMATE RISK ASSESSMENT
COMMUNITY ENGAGEMENT TOOL.

2. Vulnerability Assessment

- Which assets or resources are most affected, and which are not affected? Explain (Using Vulnerability Matrix).

Resources: livestock, hills, grazing land, water are the most affected since as they are directly impacted by the hazards i.e ~~frequent~~ intense drought bleeds trees & fodder as well as water which leads to loss of livelihood i.e general

Assets: schools and market are the assets affected by the hazards since market rely on resources and schools are affected when livelihood is lost.

- Why are some hazards more harmful to our resources than others? Explain. (Using vulnerability Matrix)

→ They are beyond human control

→ Drought clears everything that life relies on. including water, crops, pasture, livestock, and in the most severe cases takes human life

- Where and how has the vulnerability of the community increased in recent years?

Over the past 30 years the vulnerability of the community has increased. Due to prolonged droughts happening more frequently and increased heat waves. The community has experienced water scarcity and loss of their livestock. increased hunger and malnutrition.

3. Community local response and Adaptation goals

C. Main findings of the exercise

- What have been the most important impacts of those risks/hazards on the lives and livelihoods in your region? (using local response: Direct impacts)

-> loss of ~~Pasture~~ Pasture and water
-> loss of vegetation covers some trees dye due to drought the rest are destructed for livelihood support.
-> displacement from farms & homestead due to floods as well as increased breeding of mosquetos that results to increased sickness

- How do members of the community traditionally deal with the negative impacts of the prioritized hazards?

Hazard Risk	Impact	Local response	Effectiveness	sustainability
Drought	loss of Pasture	provision of hay & feed supliment	effective	not sustainable
		Migration	effective	~~not sustainable~~
		destocking	effect	sustainable.
	water scarcity	water trucking	effective	not sustainable,
		migration	effective	not sustainable
	malnutrition	moving children & elderly people to towns	effective	not sustainable
Disease	loss of lives	access to drugs & medicine	effective	sustainable
	low fertility	supplimentary feeding	effective	not sustainable
	infant mortality	access to health care and [illegible] clinical advice.	effective	sustainable
Floods	displacement	migration to safe grounds	effective	not sustainable
	inflation.	reducing cost of living ~~or~~ changing to alternative goods	effective	sustainable
	destruction of assets	repair of assets or diverting waterways	effective	not sustainable

- Which of these local responses do you think is most effective and sustainable to the impacts of the hazards? And what would make them most effective? What? What can the government do to support these?

Effective local response	What makes them more effective	What can the gov't do to supports
~~[illegible] free seed after [illegible] for vegetation~~	-> availability of water bowzers for hire	-> Construct more dames and bore holes
=> water truckings	-> ability to sustain livestock for quite sometimes	Construction of hay stores
-> provision of hay & feed supplimens	— they are cheaper to acquire	-> subsidize feed supliment
-> reducing cost of living changing to alternative that are cheaper.		-> ~~Subsid~~ food distribution
		-> access to drought funds

MANDERA COUNTY PARTICIPATORY CLIMATE RISK ASSESSMENT
COMMUNITY ENGAGEMENT TOOL.

Hazard/Risk	Impact	Local response	Effectiveness	Sustainability	What would make them effective	Government Support
Drought	water scarcity	water trucking	effective	not sustainable	availability to sustain life by access	- drilling of more boreholes in the ward.
						- Piping for major centers
	loss of livestock	Provision of hay & feed supplement	effective	not sustainable	ability to sustain life	- creation of more access roads → subsidies feed supplement → construction of hay st
	inflation	reducing cost of living by changing to alternative goods	effect	sustainable	cheaper alternative goods → still can sustain life	→ access to drought funds → elderly funds → orphan funds → ~~welfare~~ funds

- Are there government programs or other institutions in your region helping the community to become more resilient to climate change? Which ones are they? and how could they be improved?

Yes

- Cacor — Cash transfer.
- RED Cross — food distribution
- — other emergency response.
- County Govern ment → Relief food
- National Govt → Relief food.

- What actions would be needed to reach short term and long term resilience of communities against the identified priority Hazards/risks?

(1) Construction of dam around & drilling of borehole in the major centers in the ward.
(2) feed & fodder ~~Supplement~~ Provision and subsidies of the same
(3) restocking of livestocks.
(4) attaching of more medical officers at the health facilities
(5) Planting of more indegenous trees through creation of tree nurseries in the ward.

MANDERA COUNTY PARTICIPATORY CLIMATE RISK ASSESSMENT
COMMUNITY ENGAGEMENT TOOL.

- What do you think would be the best strategies for building the resilience of local people to climate change? What is needed internally and externally? What would be some of your priorities? (Action Plan)

- Establishment of water supply & distribution networks
- Enhancing water harvesting structure i.e medium size dam to provide water irrigation
- Ecosystem restoration through afforestation
- Livelihood diversification
- Establishment of veterinary drug-store
- Enhancement resilience to pest and diseases
- Improvement of transport infrastructure

Locations
- Lafey south
- Bulla Aluy
- Lafey
- Kaso
- Kamor a Elban
- Damasa location

⊛

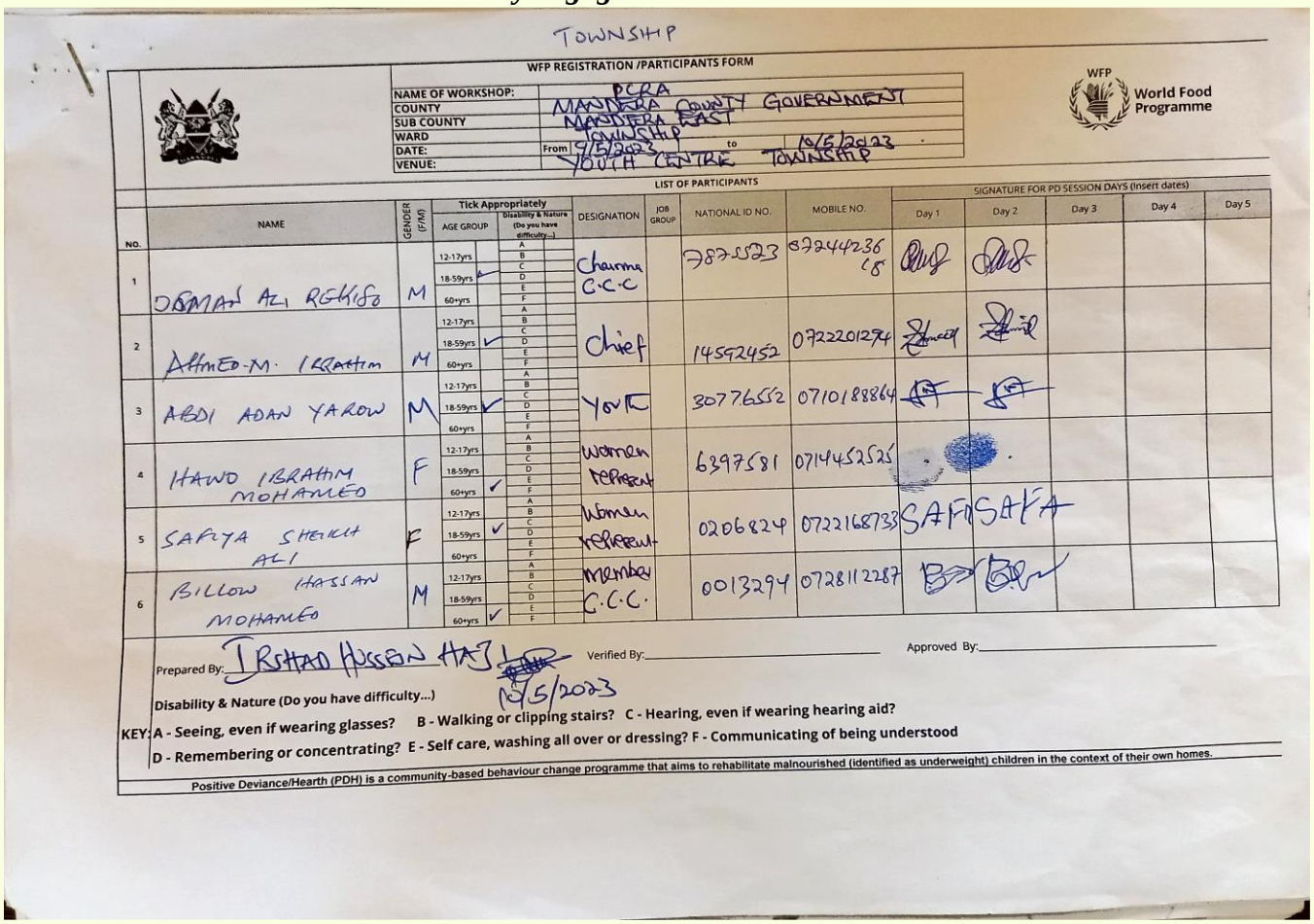
⊛ Deforestation: due - Grabbing of lands from neighboring Communities
- wildlife - Killing animals from the borders
Poachers

* Disappearance of Plant - Qalaxtorer.
- Grass - Keerimaa.

People used to it: - ~~dee~~ Habag.
Trees - Maneer - "deekaan"
- Laka. - "Garas"

* Water pans — lafey town, Damasa, Kamor lisa, Kaso,
* Indigenous trees was feed on the animals & humans feed on them

Annex 7: PCRA Ward-Level Community engagement attendance list



TOWNSHIP

WFP REGISTRATION /PARTICIPANTS FORM

NAME OF WORKSHOP: PCRA
COUNTY: MANDERA COUNTY GOVERNMENT
SUB COUNTY: MANDERA EAST
WARD: TOWNSHIP
DATE: From 9/5/2023 to 10/5/2023
VENUE: YOUTH CENTRE TOWNSHIP

WFP World Food Programme

LIST OF PARTICIPANTS

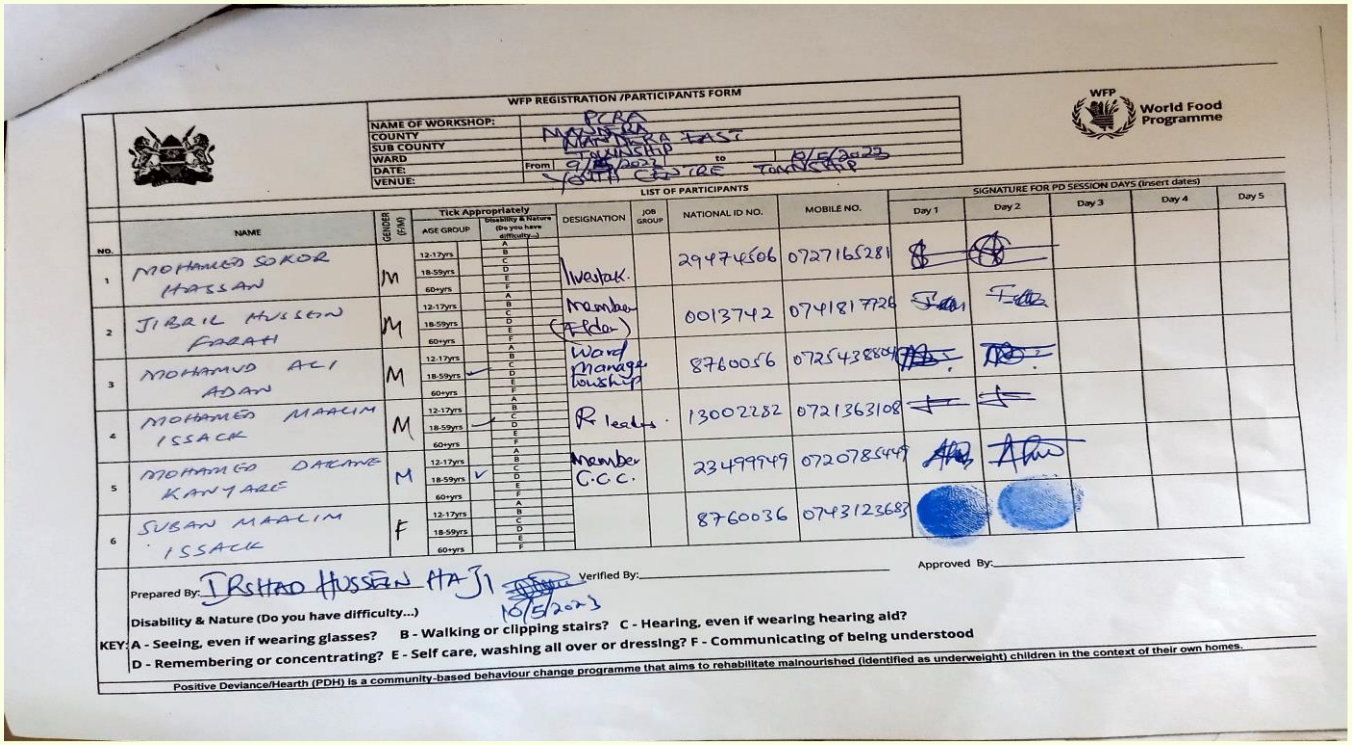
NO.	NAME	GENDER (F/M)	Tick Appropriately: AGE GROUP	Disability & Nature (Do you have difficulty...)	DESIGNATION	JOB GROUP	NATIONAL ID NO.	MOBILE NO.	SIGNATURE FOR PD SESSION DAYS (Insert dates): Day 1	Day 2	Day 3	Day 4	Day 5
1	OSMAN ALI REGISO	M	18-59yrs		Chairman C.C.C		7875523	0724442368					
2	AHMED M. IBRAHIM	M	18-59yrs		Chief		14592452	0722201274					
3	ABDI ADAN YAROW	M	18-59yrs		Youth		30776552	0710188864					
4	HAWO IBRAHIM MOHAMED	F	60+yrs		Women Rep		6397581	0714452525					
5	SAFIYA SHEIKH ALI	F	18-59yrs		Women Rep		0206824	0722168733		SAFIYA			
6	BILLOW HASSAN MOHAMED	M	60+yrs		Member C.C.C.		0013294	0728112287					

Prepared By: IRSHAD HUSSEIN HAJI 10/5/2023 Verified By: Approved By:

Disability & Nature (Do you have difficulty...)

KEY: A - Seeing, even if wearing glasses? B - Walking or clipping stairs? C - Hearing, even if wearing hearing aid?
D - Remembering or concentrating? E - Self care, washing all over or dressing? F - Communicating of being understood

Positive Deviance/Hearth (PDH) is a community-based behaviour change programme that aims to rehabilitate malnourished (identified as underweight) children in the context of their own homes.



WFP REGISTRATION /PARTICIPANTS FORM

NAME OF WORKSHOP: PCRA
COUNTY: MANDERA COUNTY GOVERNMENT
SUB COUNTY: MANDERA EAST
WARD: TOWNSHIP
DATE: From 9/5/2023 to 10/5/2023
VENUE: YOUTH CENTRE TOWNSHIP

WFP World Food Programme

LIST OF PARTICIPANTS

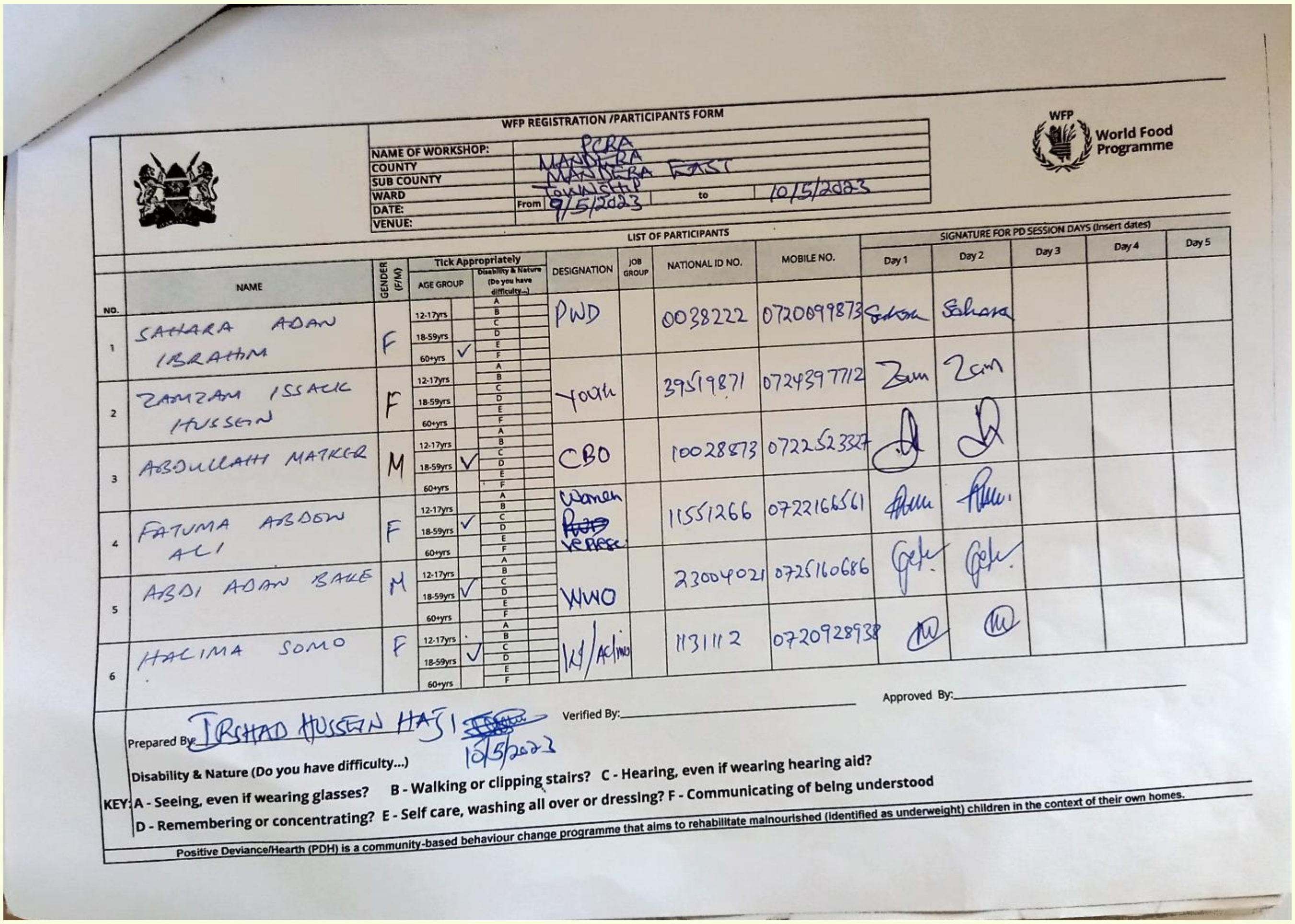
NO.	NAME	GENDER (F/M)	Tick Appropriately: AGE GROUP	Disability & Nature (Do you have difficulty...)	DESIGNATION	JOB GROUP	NATIONAL ID NO.	MOBILE NO.	SIGNATURE FOR PD SESSION DAYS (Insert dates): Day 1	Day 2	Day 3	Day 4	Day 5
1	MOHAMED SOKOR HASSAN	M	18-59yrs		Livestock		29474506	0727165281					
2	JIBRIL HUSSEIN FARAH	M	18-59yrs		Member (Elder)		0013742	0741817726					
3	MOHAMUD ALI ADAN	M	18-59yrs		Ward Manager Township		8760056	0725438804					
4	MOHAMED MAALIM ISSACK	M	18-59yrs		Leader		13002282	0721363108					
5	MOHAMED DAHANE KANYARE	M	18-59yrs		Member C.C.C.		23499949	0720785449					
6	SUBAN MAALIM ISSACK	F	18-59yrs				8760036	0743123683					

Prepared By: IRSHAD HUSSEIN HAJI 10/5/2023 Verified By: Approved By:

Disability & Nature (Do you have difficulty...)

KEY: A - Seeing, even if wearing glasses? B - Walking or clipping stairs? C - Hearing, even if wearing hearing aid?
D - Remembering or concentrating? E - Self care, washing all over or dressing? F - Communicating of being understood

Positive Deviance/Hearth (PDH) is a community-based behaviour change programme that aims to rehabilitate malnourished (identified as underweight) children in the context of their own homes.



WFP REGISTRATION /PARTICIPANTS FORM

WFP World Food Programme

NAME OF WORKSHOP:	PCRA
COUNTY	MANDERA
SUB COUNTY	MANDERA EAST
WARD	TOWNSHIP
DATE:	From 9/5/2023 to 10/5/2023
VENUE:	

LIST OF PARTICIPANTS

NO.	NAME	GENDER (F/M)	AGE GROUP	Disability & Nature (Do you have difficulty...)	DESIGNATION	JOB GROUP	NATIONAL ID NO.	MOBILE NO.	Day 1	Day 2	Day 3	Day 4	Day 5
1	SAHARA ADAN IBRAHIM	F	60+yrs ✓		PWD		0038222	0720099873	Sahara	Sahara			
2	ZAMZAM ISSACK HUSSEIN	F			Youth		39519871	0724397712	Zam	Zam			
3	ABDULLAHI MATKER	M	18-59yrs ✓		CBO		10028873	0722523327	[illegible]	[illegible]			
4	FATUMA ABDOW ALI	F	18-59yrs ✓		Women ~~PWD~~ repres.		11551266	0722166561	[illegible]	[illegible]			
5	ABDI ADAN BARE	M	18-59yrs ✓		WWO		23004021	0725160686	[illegible]	[illegible]			
6	HALIMA SOMO	F	18-59yrs ✓		KY/AC/MO		113112	0720928938	[illegible]	[illegible]			

Prepared By: IRSHAD HUSSEIN HAJI 10/5/2023 Verified By:______ Approved By:______

Disability & Nature (Do you have difficulty...)

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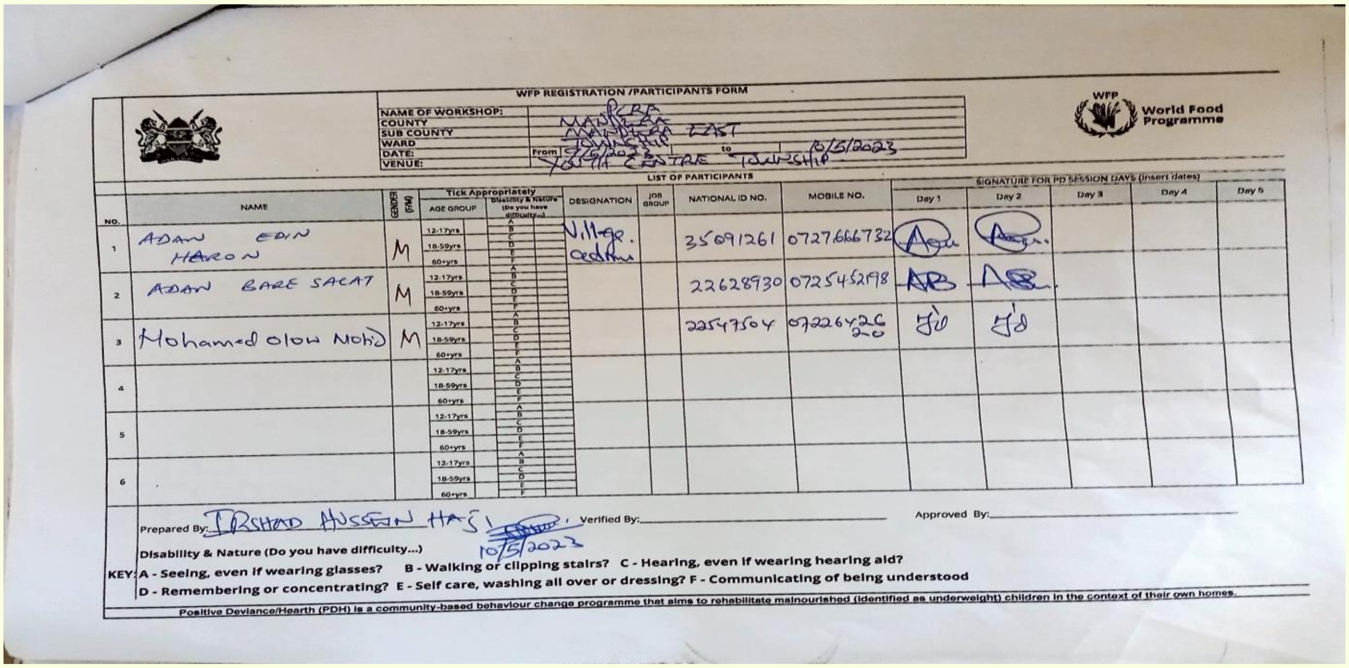

WFP REGISTRATION /PARTICIPANTS FORM

WFP World Food Programme

NAME OF WORKSHOP:	PCRA
COUNTY	MANDERA
SUB COUNTY	MANDERA EAST
WARD	TOWNSHIP
DATE:	From 9/5/2023 to 10/5/2023
VENUE:	YOUTH CENTRE TOWNSHIP

LIST OF PARTICIPANTS

NO.	NAME	GENDER (F/M)	AGE GROUP	Disability & Nature (Do you have difficulty...)	DESIGNATION	JOB GROUP	NATIONAL ID NO.	MOBILE NO.	Day 1	Day 2	Day 3	Day 4	Day 5
1	ADAN EDIN HARON	M			Village admin		35091261	0727666732	[illegible]	[illegible]			
2	ADAN BARE SALAT	M					22628930	0725452198	AB	AB			
3	Mohamed olow Nohd	M					22547504	0722642620	[illegible]	[illegible]			
4													
5													
6													

Prepared By: IRSHAD HUSSEIN HAJI 10/5/2023 Verified By:______ Approved By:______

Disability & Nature (Do you have difficulty...)

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