COUNTY GOVERNMENT OF TRANS NZOIA

The Trans Nzoia County Participatory Climate Risk Assessment, 2023

The development of this Participatory Climate Risk Assessment (PCRA) was jointly funded by GoK and World Bank through FLLoCA program, GIZ and the County Government of Trans Nzoia.

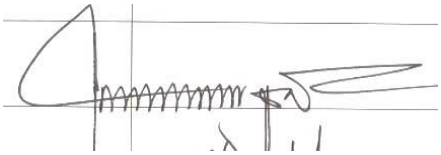
May 2023

FOREWORD

Climate change is a major threat to Trans Nzoia county`s socio-economic wellbeing and has the potential to roll back the development gains made over the years and threatens the attainment of our own third generation County Integrated Development Plan (2022-2027), the Governor's manifesto and BETA. In line with our responsibility to mitigate the effects of climate change and in keeping with the objective of the Paris Agreement, the Trans Nzoia County Climate Change Fund Act 2021 was enacted to provide a legal framework for enhanced response to climate change at the county level.

With the roll out of FLLoCA program,the focus of climate action has been cascaded to ward level. This Participatory Climate Risk Assessment (PCRA) report identifies critical climate change hazards, their impacts on different sectors and groups and proposed mitigation measures to ensure that developments remain sustainable in the event of any adverse climate change impacts, including extended dry spell, floods and other extreme climate events that have in the recent past occasioned far-reaching negative implications on our economy. The key hazards identified included prolonged dry spells, floods and increased incidences and emergence of vectors, pests and diseases. The proposed key actions by the Ward Climate Change Planning Committees include increased forest cover to at least 20% of our land area by planting over one million tree seedling per year, construction of water harvesting structures, enhanced irrigation and livestockvaccination.

For effective implementation of this proposed adaptation measures, collective contributions from the National and County Governments, the private sector, the civil society, faith based organizations, other non-state actors and individual citizens will inform the development and implementation of the County Climate Change Action Plan which will help deliver the expected transformational development agenda.



H.E George Natembeya, EBS, MBS
The Governor,
Trans Nzoia County

ACKNOWLEDGMENT

This PCRA report identifies the key climate hazards within the County which impact negatively on the development agenda and proposes measures which will inform the development of the Trans Nzoia County Climate Change Action Plan [CCCAP] 2023- 2027 to guide the County's Climate Change actions including the reduction of greenhouse gas emissions. The report seeks to further the County's development plan by proposing mechanisms and measures to achieve low carbon climate resilient development in a manner that prioritizes adaptation.

The development of this report was guided by a Participatory Climate Risk Assessment [PCRA] task force which was appointed by the County Executive Committee Member [CECM] Water, Environment, Natural resources and climate change. It also involved the participation of state departments and agencies of the National government, County departments, civil society, the private sector, academia and the Ward Climate Change Planning Committees [WCCPC]. I take this early opportunity to recognize their efforts.

Technical inputs to this PCRA report were enriched through ward level community engagements working groups whose membership is inclusive and drawn from vulnerable communities, civil society, the academia and the private sector. Contributions from members of the task force both at individual and group levels aregreatly appreciated. The department of Water, Environment, Natural resources and climate change is also grateful to GIZ, the National government and World Bank climate change experts that provided valuable technical inputs to the process. I commend the Chief Officer for Water, Environment, Natural resources and Climate Change for ably chairing and the Climate Change Unit Focal Person for coordinating the entire process of drafting the PCRA report including managing contributions from contracted experts. I recognize the experts for their professionalism and diligence throughout the process of drafting PCRA report.

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DEFINITION OF TERMS

Term	Definition
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	The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.
Climate Change	Refers to a 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.
Climate Change Mainstreaming	The integration of priority climate change adaptation responses into development, so as to reduce potential development risks and take advantage of opportunities.
Climate Change Vulnerability	The degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with adverse impacts of climate change. Impact here refers to a specific change in a system caused by its exposure to climate change
Climate hazard	A physical process or event (hydro-meteorological or oceanographic variables or phenomena) that can harm human health, livelihoods, or natural resources
Exposure	Refers to whether the asset or system is located in an area experiencing direct effects of climate variables.

Mitigation	Refers to 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	Refers to the capacity of social, economic and environmental systems to cope with a hazardous event, trend, or disturbance. It is manifested through responding or reorganizing in ways that assert the essential function, identity, and structure of the system, while also maintaining the capacity for adaptation, learning and transformation

ACRONYMS

ADP	Annual Development Plan
CBO	Community Based Organization
CFG	Climate Finance Governance
CGTN	County Government of Trans-nzoia
CHVs	Community Health Volunteers
CIDP	County Integrated Development Plan
CSO	Community Social Organization
FGD	Focus Group Discussion
GIS	Geographic Information Systems
GIZ	German Agency for International Cooperation
HH	Household
ICT	Information Communication Technology
IPCC	Inter-Governmental Panel on Climate Change
KFS	Kenya Forest Service
KII	Key Informant Interview
KWS	Kenya Wildlife Service
LULC	Land Use and Land Cover
LVI	Livelihood Vulnerability Index
MSME	Micro Small and Medium Enterprises
NCCAP	National Climate Change Action Plan

NDC	Nationally Determined Contributions
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
PLWDS	People Living with Disabilities
SLA	Sustainable Livelihood Approach
SLM	Sustainable Land-use Management
TI	Transparency International
TOR	Terms of Reference
IP	Indigenous People
UNFCCC	United Nations Framework Convention on Climate Change
WCCPC	Ward Climate Change Planning Committee

EXECUTIVE SUMMARY

The impacts of climate change have been and continue to be experienced in Trans Nzoia County. The county has been ravaged by extreme climatic events such as, mid-season dry spells, droughts and floods among others that have damaged both property and livelihoods. Thus, climate change presents a threat to the achievement of Kenya's national goals, aspirations, and development priorities. The assessment was conducted to: Identify the climate change risks, hazards andvulnerabilities in Trans-Nzoia County; establish the likelihood and impact of current and future climatic hazards; identify the vulnerable sectors to climate change in the County and identify their respective adaptive capacities; develop a climate change vulnerability and risk map of the County and develop a list of indicators for the vulnerability to climate change. This is in line with national and international policies on climate change action that recognize the role of climate change risk and vulnerability assessments in enhancing a targeted approach to tackling climate change. For instance, the Paris Agreement calls for the development of relevant plans and policies including the assessment of climate change impacts and vulnerability with a view to formulating nationally determined prioritized actions. The National Climate Change Framework Policy requires the Government to ensure integration of climate change risk and vulnerability assessment in environmental impact assessments and strategic environmental assessments to enhance climate resilience and adaptive capacity.

CHAPTER ONE:

1.0: INTRODUCTION AND SITUATION ANALYSIS

1.1. County Background Information

Trans Nzoia is one of Kenya's 47 Counties as established by the Constitution of Kenya 2010. There are a total of 25 wards spread among its 5 Sub Counties; Kiminini, Saboti, Endebess, Kwanza, and Cherangany. The county is well renowned for the large-scale cultivation of maize, which has led to it being dubbed "Kenya's breadbasket." The county's fertile soils and favorable climatic conditions favor development of all types of crops, through the implementation of Climate Smart Agriculture. Trade and Tourism are two more key drivers of the county's GDP.

The county has two National Parks namely; Mt. Elgon and Saiwa Swamp National Parks and is home to two out of the five major water towers in the country; Mt. Elgon and Cherangany Hills. The County Government has put measures to enhance water supply through equipping and solarization of boreholes among other water harvesting techniques. The total forest cover in Trans Nzoia County is 13.16% compared to the national figure of 8.83%, while tree cover is 15.16% compared to the national figure of 12.13% (Kenya Forest Service, 2021). This is mainly contributed by key forest areas like Mt. Elgon, Kiptogot, Kimothon, Saboti, Sosio, Kapolet, Sikhendu, and Kitale Township. There is a **target to achieve 20% tree cover by 2027** which will be realized through tree growing initiatives and awareness creation on biodiversity protection. However, despite the County's productivity potential, the county is faced with climate change shocks such as prolonged dry spells, floods, pest and diseases and declining soil fertility. Climate change is cross-cutting in major sectors such as Health, Agriculture, Water, Environment and Education.

1.1.1 Position and Size of Trans Nzoia County

The County is situated in the North Rift region and covers an area of 2,495.6 square kilometers. It lies approximately between latitudes 00° 52´ and 01° 18´ north of the equator and longitudes 34° 38´ and 35° 23´ east of the Greenwich Meridian. Trans Nzoia borders the Republic of Uganda to the West, Bungoma and Kakamega Counties to the South, West Pokot County to the North besides Elgeyo Marakwet and Uasin Gishu Counties to the South East. Figure 1 shows the location of Trans Nzoia in the Kenyan Map.

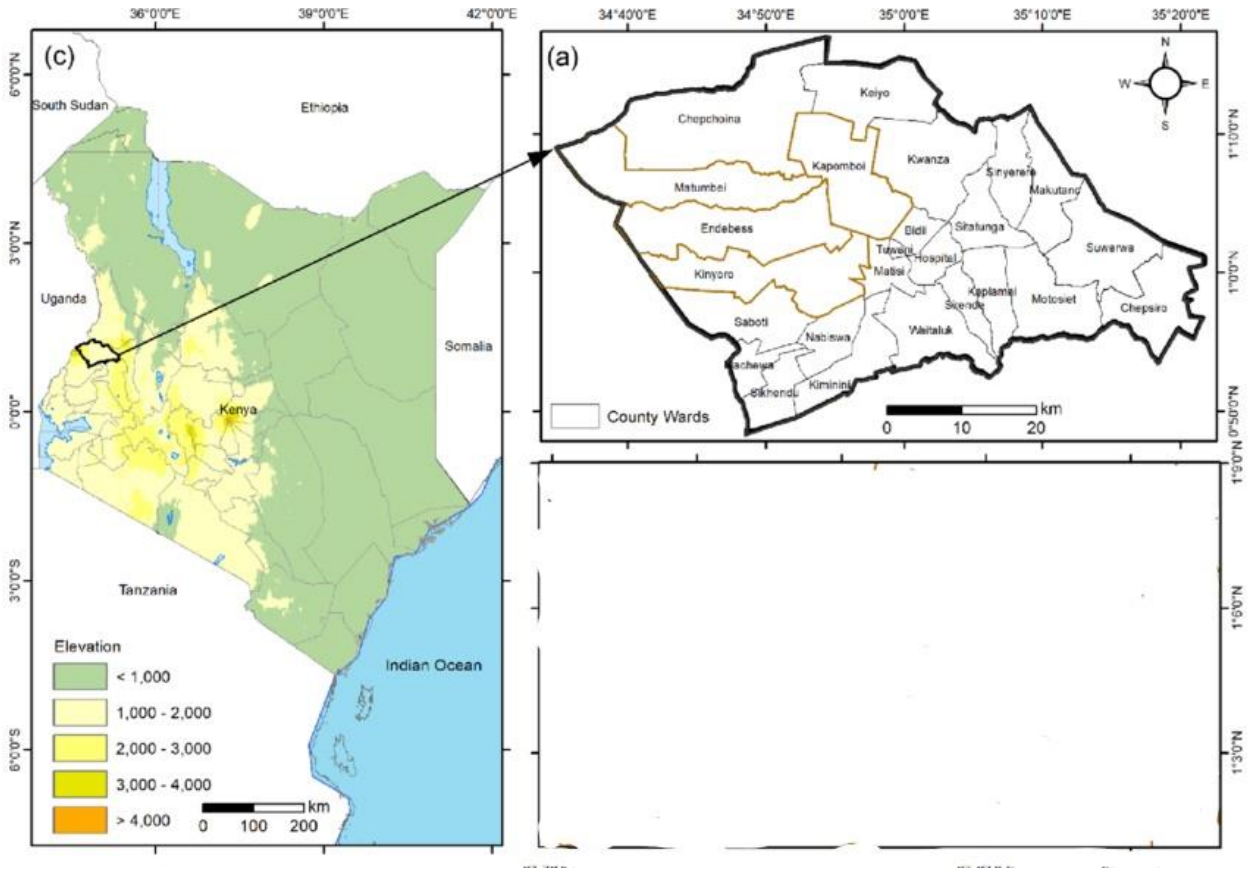


Figure 1: **Map - Position of Trans Nzoia County in Kenya (Source: Kenya National Bureau of Statistics, 2013)**

1.1.2 Physiographic and Natural Conditions

1.1.2.1 Physical and Topographic Features

Trans Nzoia County is generally flat with gentle undulations rising steadily towards Cherang'any Hills to the east and Mt. Elgon in the northwest. Mt. Elgon is the second highest mountain in Kenya with an important ecosystem shared between Trans Nzoia and Bungoma Counties and Bukwo district in the Republic of Uganda hence it is a unique resource for environmental and wildlife conservation.

The altitude ranges from the lowest point 1,660m in Sikhendu ward at 34.811877°E and 0.812766°N at to 4,299m above sea level at the peak of Mt. Elgon in the Kenyan side with undulating terrain across the County.

There are 15 rivers in the County with the main ones being; Nzoia, Sabwani, Rongai, Noigamaget, Suam/Turkwel, Kaptega, Kiminini, Namuichula and Losourwa rivers. River Nzoia drains into Lake Victoria. The tributaries of river Sabwani are; Kiptogot, Kaibei, Kimothon, Sinyerere, Tongaren and Kabuyefwe while the tributaries of Noigamaget (Kapolet) are; River Suam, and Kapterit. Water from the rivers is utilized for domestic consumption, small scale irrigation and there is **a potential for hydroelectric power generation to support rural electrification**, industrialization and fisheries. The above-mentioned activities could be mitigation towards floods in the County. The catchments **of River Nzoia and its tributaries are however threatened by encroachment**. The **largest natural forest cover in the County is found in Mt. Elgon and the Cherang'any Hills.** However, continued pressure from human activities has negatively affected the **tree cover which continued to reduce from 17% in 2013 to the current 15.16%.** The forests are critical to the climatic conditions of the territorial boundaries of the County and beyond, as they form the water catchments.

1.1.2.2 Climatic Conditions

The County has a cool and temperate climate with mean maximum (day time) temperatures ranging between 23.4°C and 29.2°C and mean minimum (night time) temperatures ranging between 11.0°C and 13.5°C. The maximum and minimum extreme temperatures are recorded in February (about 34.2°C) and January (about 6.5°C) respectively. The mean monthly relative humidity is 67%, ranging from a maximum of 97% in July and a minimum of 35% in January. The mean wind speed within the county is 66.79 km/h or 36.06 knots.

The County receives annual rainfall ranging from 1**,000mm to 1,700mm.** The Western parts of Endebess, Saboti and Kiminini Sub Counties, and the North Western parts of Cherang'any Sub County receive the highest rainfall ranging between 1,300mm and 1,700mm per year. The eastern parts of Saboti and Kiminini Sub Counties, southern parts of Kwanza Sub Countyas well as the western and central parts of Cherang'any Sub County receive moderate rainfall ranging from 1,200 to 1,300mm. The Northern parts of Kwanza Sub County, Eastern parts of Endebess Sub County, South Eastern parts of Cherangany Sub County (Tuigoin) and South Eastern parts of Kiminini Sub County (Waitaluk) receive the lowest amounts of rainfall (1,000mm – 1,200mm). Map 2 shows the distribution of annual mean rainfall by Sub County.

The annual rainfall is distributed into three major seasons namely; Long rainfall season- March, April, May (MAM), Intermediate Season- June-July-August (JJA); and short rainfall season- October-November-December (OND). The long and intermediate seasons are more reliable for agricultural production as compared to the short rainfall season. In the recent past, drought, dry spells and floods hazards have increased in frequency and severity, exacerbated by climate change. Uncertainty about the planting season, including; the onset and end of the rainy season, **moisture stress, and excess rainfall** are the main climatic hazards that affect productivity, thus compromising food security in the County.

1.1.2.3 Ecological Conditions

The County is divided into three **major agro-ecological zones** which include: the Upper Highland Zones, Upper Midland Zones and the Lower Highland Zones.

Upper Highland Zone: The Upper Highland Zone covers the hills and slopes of Mt. Elgon, Cherang'any hills and the boundary zone towards West Pokot County. The zone lies between altitude 2,400 and 4,299 metres above sea level and constitutes about 16 percent of the County land area. The area is covered with high vegetation, shallow stony soils and rocky outcrop. Mt. Elgon National Park is a major tourist attraction site. **An establishment of a transition zone around The National Park would play a significant role as a buffer zone for the protected area and mitigation against human-wildlife conflicts**. The area also has **limited potential for sheep and dairy farming especially at the transition area**.

Lower Highland Zone: The Lower Highland Zone covers the slopes of Mt. Elgon and Cherang'any Hills with an altitude ranging from 1,800-2,400 metres above sea level. This zone covers 848.64 square kilometres and constitutes 34 percent of the total area of the County. The soils found in this zone are red and brown clay derived from volcanic ash. These soils are fertile with a high content of clay mineral which gives a continuous supply of plant nutrients. This zone supports agricultural and livestock activities. The farming activities in this region include cultivation of; **wheat, tea, maize, barley, sunflower, coffee and horticulture as well as rearing of cattle and sheep.** Despite the high potentiality of these areas, th**ere is poor transport network that hinders efficient movement of the farm produce to markets**.

Upper Midland Zone: The zone covers 1,248 square kilometres which is approximately 50

percent of the total area of the County. It lies between altitudes 1,700 and 2,000 metres above sea level. The mean annual rainfall in this zone is between 900 to 1,400mm per annum. The region includes the Endebess Plains stretching east of the Kitale Plains and further towards the areas below the slopes of Cherang'any Hills. The zone stretches to the border of Tongaren Scheme in Bungoma County to the south and West Pokot County towards the north. The Zone is covered with well drained deep red and brown clays and sandy clays derived from the basement complex. There is a considerable size of land with black cotton soil along the Koitobos River in the Endebess Plains. Farming activities in this region include cultivation of **maize, sunflower, coffee, wheat and barley as well as dairy, beef, sheep and horticulture production.**

1.1.3 Administrative and Political Units

1.1.3.1 Administrative Units

The County is divided into five administrative **sub counties namely Kiminini, Saboti, Cherang'any, Endebess and Kwanza**. The sub counties are further sub-divided into **twenty five administrative wards**. **Table 1** shows the administrative units in the county with respect to divisions, locations and Sub locations while **figure 2** shows the county administrative units. Distribution of population in the administrative unit found in Annex 1 county fact sheet.

Table 1: County Electoral wards by constituency

Constituency	County Assembly Wards
Kwanza	Kwanza; Keiyo; Bidii; Kapomboi
Endebess	Endebess; Matumbei; Chepchoina
Saboti	Kinyoro; Matisi; Tuwan; Saboti; Machewa
Kiminini	Kiminini; Waitaluk; Sirende; Hospital; Sikhendu; Nabiswa
Cherang'any	Motosiet; Sitatunga; Kaplamai; Makutano; Sinyereri; Cherang'any- Suwerwa; Chepsiro-Kiptoror

Source: IEBC Trans Nzoia

1.1.4 Demographic Features

1.1.4.1 Population Size, Composition and Distribution

According to Kenya Population & Housing Census 2019 Census the county has a total of 990,341 persons comprising of 489,107 males, 501,206 females and 28 inter sex. The County has generally **a youthful population with 77.1 percent** (763, 969 persons) of its population below the age of 35 years depicting high need for employment opportunities and demand for education, health and social amenities. On the other hand the **economically active age group** which comprises the cohort of (15-64) years represents **53.9** percent of the total County population while the female reproductive age group (15-49 years) consists of **24** percent of the total population. Trans Nzoia County has two **main urban centres namely Kitale and Kiminini** towns. The 2019 census enumerated a total population of 178, 734 persons in the two urban areas out of which Kitale had 162, 174 inhabitants while Kiminini had 16,560 inhabitants. The populations of these towns were projected to increase to 199,119 in 2022 and 238,388 in 2027 respectively.

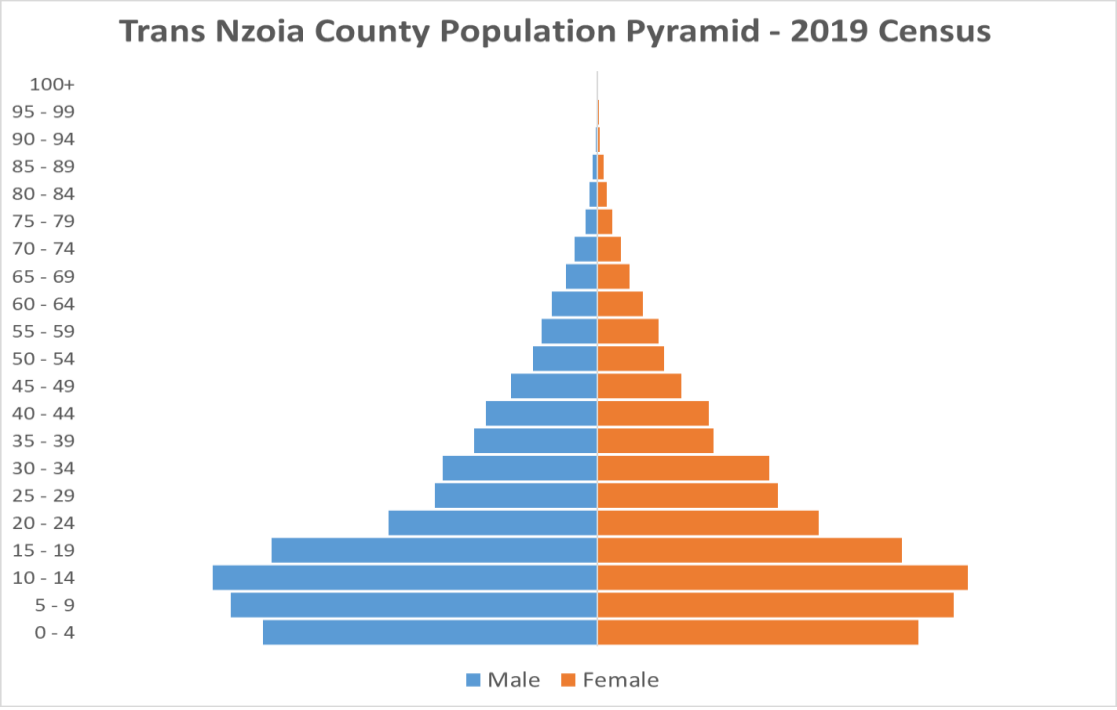


Figure 2: County Population Age Structure (*Source: Kenya National council for population and development)*

Trans Nzoia Population pyramid (Figure 2) shows a wide base but the populations of the age groups taper towards higher age groups. This indicates that Trans Nzoia's population has high birth rates, but also has a high mortality rate. The table A-2 shows the projected population for the five sub counties by sex namely Saboti, Cherangany, Kwanza, Endebess and Kiminini for the years 2019, 2022, 2025 and 2027 while table A-3 provides a summary of population density and distribution by sub-county.

Kiminini Sub County is the densely populated with the highest projection rise from 662 persons per square kilometer in 2019 to 737 people per square kilometer in 2022 and expected to rise further to 821 persons per square kilometer in 2027. On the other hand, Endebess is the least populated sub county with the lowest population density rising of 165 persons per square kilometer in 2019 and projected to rise to 205 persons per square kilometer in 2022. This is also expected to rise to 225 persons per square kilometer in 2027. The low density in Endebess Sub County is attributable to parts of the county being covered by Mt. Elgon Forest, large tracts of ADC land and the Mt. Elgon National park. Table A-3 provides a summary of population broad age groups.

The Youthful Population (15-29 years)

The 2019 census enumerated the youthful population as 277,601, projected to rise to 309,261 in 2022 out of which 151,634 are males and 157,627 are females. The population is projected to increase further to 344,531 and 370,252 in 2025 and 2027 respectively. **The youth form 37 percent of the County's population**. This calls for interventions that will empower youths through **employment creation**. The county will **promote technical skills in youths through expansion and equipping of the Vocational training institutions** to support the growing population.

Women of Reproductive Age (15-49)

The 2019 census enumerated a total of 238,261 females in this age category. This number is projected to increase to 265,434 in 2022 and further rise to 317,782 by 2027. To meet the needs of this age group, the County Government **will make investments to promote better adolescent, maternal, and neo-natal health services**. In addition to encouraging the use of **family planning supplies, competent birth attendants will be encouraged to facilitate deliveries in an effort to lower maternal mortality rates**.

Economically Active Population (15 – 64) Years

The labor force population of ages 15-64 years is projected at 628,465 persons in 2022 representing 59.9 percent of the total County population, indicating a dependency rate of 67 percent. This population is projected to increase to 683,287 in 2025 and further rise to 719,345 by 2027. The County Government shall **implement projects and programmes that will stimulate economic growth through employment creation, provision of favorable business environment and increasing agricultural productivity and value addition.**

1.1.4.2 Population of Persons with Disability

According to the 2019 census report the county has a total of 24,146 persons with disabilities. This corresponds to 2.4 percent of the total county population. The main types of the disabilities identified in the census report are visual, hearing, mobility, cognition, self-care, communication and albinism. Majority of the reported disabilities are of visual type (6,609), followed by mobility (6,166) while the disability type with least persons is self-care (2,272). Additionally, majority of the persons with visual, hearing, mobility, self-care and cognition are in the age category of 55 years and above while that of communication are in the range of 5-14 years. This indicates that the county **Government needs to invest on programmes that take care of the vulnerable persons living with disability**. Such programmes would include; social protection initiatives, promotion of favorable infrastructure to persons with disability among **others**. The **table A-5** provides a summary of the population of persons with disability by Sub County, type and gender.

1.1.5 Poverty Analysis

The **monetary poverty rate for Trans Nzoia is 34.1%** which is nearly the same as the national rate of 35.7% with approximately 337,935 people in Trans Nzoia being monetarily poor. Trans Nzoia has a **multidimensional poverty rate of 58.7%,** which is 24-percentage point higher than the monetary poverty rate of 34.1% with a total of 580,834 people being multidimensionality poor.

When disaggregated by age groups, 57.7% of children in Trans Nzoia are multidimensionality poor. This is 5-percentage points higher than the national average of 52.5%. Among the youths,

54% are multidimensionality poor compared to a national average of 48.1% while for the elderly population, 58.7% are multidimensionality poor compared to a national average of 55.7%.

Among children aged 0-17, the core drivers of **multidimensional poverty are sanitation (72.8%), housing (67.7%), nutrition (50.7%) and information (30.2%). For youths aged 18-34, the core drivers of multidimensional poverty are sanitation (58.9%), housing (58.4%), education (55.7%) and economic activity (38.6%). Among adults aged 35-59, the core drivers of multidimensional poverty are education (72%), economic activity (73%), sanitation (66%) and housing (60%). Among the elderly aged 60+, the core drivers of multidimensional poverty are sanitation (75%), housing (72.4%), nutrition (52%) and education (42%).** More so, climate change impacts; for instance; erratic rainfall has in the recent past led to reduced farm productivity (reducing household income) thus exacerbating County poverty levels. The County Government therefore needs to advocate for climate resilience livelihood interventions. Food insecurity

1.1.6 Energy, Transport, Infrastructure and ICT

The sector comprises of Public works, Roads, and Mechanical, Energy, fire management and ICT sub sectors. The Public works sub-sector plays a fundamental role as an enabler of building service provision by designing, costing, implementation of projects and offer technical support during project life cycle. **Mechanical sub sector deals with management of County garage and repair of county motor vehicle**. The County fire fighting unit plays critical role in protection and rescue of properties and life against fire outbreak disaster.

Energy sub sector has installed and maintained security lights, county roads network and improved drainage systems. The sub sector has constructed/upgraded 33km of gravel roads to bitumen standard and periodic maintenance of urban streets. The sector has constructed 3.87km of roads which includes; Referral hospital access road, Back Street, Igana lane, Cinema lane, Sungura lane phase I and II, Milimani-showground, Kiminini township access roads and Assembly-police line. **The County Government needs to adopt climate proof infrastructure such as improved drainage system, promote roof catchment, ground water reservoirs among others.**

The ICT sub-sector in the county is relatively small in terms of personnel but has huge potential in raising awareness of climate change, in educating people how to mitigate it, and in building up

human resources to adapt to its effects. The county government in collaboration with Kenya Metrological Department have in the past used local radio stations and telephone digital technology in the dissemination of weather and climate information.

1.1.7 Education and literacy

The ECDE sub sector had a total of 434 public centers. The increment is attributed to the effort made **by the county to acquire land for the establishment of ECDE centers**.
The enrolment at the Vocational Training Centers stands at 3200. These achievements have been attributed to the improved infrastructures, provision of tools and equipment in all the 32 VTC centers in the County.

1.1.8 Agriculture

The Agriculture Sector comprises of Crop Production, Livestock Production, Fisheries and Irrigation sub- sectors. This sector plays a significant role in economic and social development through promoting food security; income generation; employment and wealth creation; foreign exchange earnings as well as security of land tenure and public land management.

The total Trans Nzoia county agricultural land is 154,167 Ha of which 105,145Ha is under **subsistence crop farming and 47,750Ha is under commercial crop farming** (Source: Census 2019). The county is endowed with good climate for livestock husbandry. The following are livestock reared: cattle (dairy, beef and indigenous), poultry (indigenous chicken, exotic chicken (layers and broilers), ducks, turkeys, geese and pigeons), bee keeping, pigs, goats (local goats, dairy goat), hair sheep and rabbits. Approximately 40 per cent of the county's economic activity is driven by the agriculture sector. It also contributes to economic growth through forward and backward linkages with other sectors in the county and the country at large. **The county Food Poverty Estimates (individual) is 32.9 percen**t based on the 2015/16 Kenya Integrated Household Budget Survey (KIHBS), therefore the sub sector aims at reducing food shortage at household levels.

1.1.9 Health Services

Trans Nzoia County has a total of 83 dispensaries, 21 health centers, 6 sub-county hospitals and two county referral hospitals with one still under construction.

Trans Nzoia County Referral Hospital has operationalized Chronic Disease Management and Palliative Care Units. The facilities offer reproductive, maternal, neonatal, child health care. The proportion of fully immunized children was increased from 54.8 percent to 79.9 percent while the proportion of skilled delivery rose from 30.7 percent in 2018 to 67.7 percent in 2022. Under HIV/AIDS prevention and control the County's population under treatment has increased from 50.5 percent to 83.9 percent. Similarly the viral suppression was also increased from 69.7 percent in 2018 to 87.5 percent in 2022.

Malaria prevalence rate is 33.4 percent. Low income households bear more load of malaria cases as compared to higher income households**. Malnutrition** among children is manifested by 14.8 per cent being underweight, 28.4 per cent stunting and 2.6 per cent wasting. The County Government is creating awareness on **general sanitation**, through advocating for Community Led Total Sanitation.

1.1.10 Water, Environment and Natural Resources

The households that have access to clean and safe water is at 51% with a target of 80% by the year 2027. This has been **attributed by extension of water service line by 220km**, construction and **protection of 110 spring sources, drilling and equipping of 64 boreholes and development of 16 hand dug wells.** The sub- sector, constructed 6 sanitation blocks in markets which improved sanitation standards. The sub sector has procured a skip truck and eleven (11) bulk bins giving a total of 2 skip trucks and 23 bulks bins which have helped in solid waste management**. The average volume of solid waste generated annually is 30,000 tonnes.**

There exists a huge potential for reforestation, expanding water supply and sustainable waste management.

1.1.11 Youth, gender, sorts and culture

The number of children with special needs consists of 443 males, 422 females., Number of PWDs 29,553, correctional /rehabilitation facilities 1, Number of registered Women groups 5107, youth groups 2657, SHGs 7192. There exist two cultural centres and 6 community resource centres. **County Social Safety programmes** will be enhanced to cushion the marginalized in the community from adverse socio-economic effects resulting from Climate Change. (KNBS 2019)

1.1.12 Trade, Industry and Tourism

The county boasts of a wide range of natural resources such as granitic rocks, Mt. Elgon and Saiwa Swamp National Parks provide an avenue for tourists' attraction (Statistics from KWS) which can be productively harnessed thereby creating jobs. **There are 146 trading centres in the county, 30 hotels and restaurants, 7 tourist attraction sites, 1 tourist class hotel and 1 factory.** The unique landscape in the County presents a huge potential for tourism activities. The sector is vulnerable to climate change impacts such as; prolonged dry spells resulting to the death of wildlife.

1.2. The Climate Change Policy and Legal Framework

The PCRA was conducted in fulfillment of the policy and legal requirements ranging from local to national and to global. Different pieces of laws and policy documents that relates to the PCRA process at the county, national, regional and global levels are discussed hereunder.

The climate change policy and legal framework in Kenya is based on the established international and national climate change agreements, treaties, policies and laws. This section presents an analysis of the climate change legal and policy framework in three categories namely:

a) County climate change policy and legal framework
b) National climate change policy and legal framework; and,
c) International climate change policy and legal framework.

1.2.1. County Climate Change Policy and Legal Framework

1.2.1.1.The County Climate Change Policy, 2020

The County Government of Trans Nzoia has enacted Climate Change Policy 2020, upon which this climate change risk assessment process is anchored. The policy envisages that among other actions, the county government of Trans Nzoia shall undertake Climate Change Action Planning, Risk Assessment, Vulnerability Assessment and Adaptation planning for effective implementation of climate actions. The policy vision for the County is **"an outstanding climate resilient and sustainable agro-industrialized county"** with a mission, "To enhance integrated climate change adaptive and mitigative actions for sustainable economic and socio-ecological development"

The strategic goals for this policy are:

1. To enhance community resilience to climate change
2. To develop and promote integrated waste management and sustainable natural resource management
3. To promote protection, rehabilitation and conservation of water resources.
4. To promote protection, management and conservation of forests and allied resources
5. To enhance prevention and control of vector and water borne diseases.
6. To enhance food security and nutrition
7. To enhance livestock production and value chain development.
8. To promote productivity and industrial growth
9. To promote climate proof, quality and suitable infrastructure
10. To protect and conserve wildlife resources for tourism promotion and posterity
11. To improve planning, coordination and management for better governance of the Trans Nzoia county climate change sector

1.2.1.2.Trans Nzoia County Climate Change Fund Act, 2022

Furthermore, Trans Nzoia County Climate Change Fund Act, 2020 was enacted to guide budgeting and governance for climate change in the county. The Act dedicates 2% of the County Budget into a fund, specifically for climate change programs coordination and implementation hence the **climate change risk assessment will form a basis for evidence based climate response**.

1.2.1.3.The County Integrated Development Plan (CIDP) 2023-2027

The County Integrated Development Plan (CIDP) is a crucial planning tool mandated by the Constitution of Kenya and the Public Finance Management Act. It involves a long-term and medium-term planning process to establish strategic priorities for county governments. In line with this, the climate change Act emphasizes the integration of climate change actions into CIDPs and county sectoral plans.

Trans Nzoia County's CIDP for the period 2023-2027 focuses on priority areas such as **poverty reduction, youth employment, and increased land productivity**. Agriculture is recognized as the backbone of the county's economy, with mixed farming and horticulture gaining prominence.

Environmental concerns include climate change, land degradation, loss of biodiversity, and challenges related to pollution, deforestation, solid waste management, and natural disasters.

The development thrust of the CIDP includes initiatives to increase land productivity, promote agricultural value chains and marketing, improve access to clean water and sanitation services, enhance early childhood education, provide technical skills training, generate employment through industrialization, improve infrastructure, ensure access to quality healthcare, facilitate land ownership, and empower youth and women through dedicated funds. These projects and targets aim to address the identified priorities and contribute to the county's overall development.

1.2.2. Governor's manifesto

The Governor's Manifesto is a crucial planning tool that informed purpose and objective of all other County planning tools. It involves a long-term and medium-term planning process to establish strategic priorities for county governments. In line with this, the CCAP emphasizes the integration of climate change actions towards achievement of Governor's manifestos, CIDP, BETA and Vision 2030.

The development thrust of the Governor's manifestos towards Climate change resilience building includes initiatives **to increase land productivity through climate smart agricultural activities such as agricultural value addition and marketing, livelihood diversification and conservation agriculture among others; improve access to clean and adequate water and sanitation services through pipeline extension, equipping and solarization of the boreholes, rehabilitation of water pans/dams, establishment of water supply systems and protection of water catchments; reduce greenhouse gases through growing of at least 1,000,000 trees annually and development of Non-Motorized Transport (NMT) including pedestrian walk ways and cycling lanes; modernize county infrastructure to a more climate compliant**; Ensure youth, women and PWDs groups access government procurement opportunities (AGPO);: enhance early childhood education, provide technical skills training, create employment through industrialization, improve infrastructure, ensure access to quality healthcare, facilitate land ownership, **and empower youth and women through dedicated funds**. These programs aim to address the identified CCAP priorities and contribute to the county's overall development.

1.2.3. National Policy Context

1.2.3.1.The Constitution of Kenya 2010

The Constitution of Kenya 2010 establishes a devolved system of governance with two levels of government: the national government and the 47 counties led by elected county governments. These levels of government are distinct and inter-dependent, conducting their mutual relations through consultation and cooperation. The county governments have specific roles and responsibilities outlined in Schedule Four of the Constitution, including **natural resources management, pollution control, agriculture, implementation of national government policies, and environmental conservation**.

The Constitution also guarantees the right to a clean and healthy environment, protecting it for the benefit of present and future generations. Article 43 recognizes every person's right to reasonable standards of sanitation and access to clean and safe water in adequate quantities.

Under **Article 69(1), the State is mandated to ensure sustainable exploitation, utilization, management, and conservation of the environment and natural resources, while promoting the equitable sharing of benefits**. It encourages public participation, protects genetic resources and biodiversity, enhances intellectual property and indigenous knowledge, and utilizes the environment and natural resources for the benefit of the people of Kenya.

The Constitution includes provisions for affirmative action for marginalized groups (Article 56) and the management of community land (Article 63). Chapter five of the Constitution specifically addresses land, environment, and natural resources. In summary, the Constitution of Kenya 2010 establishes a devolved system of governance, guarantees the right to a clean and healthy environment, and emphasizes sustainable management and utilization of natural resources for the benefit of the people of Kenya.

1.2.3.2.The Kenya Vision 2030

The Kenya Vision 2030 is a national blueprint that aims to transform Kenya into a middle-income country by 2030, providing a high quality of life for its citizens in a clean and secure environment. It is based on three pillars: **economic, social, and political.**

The economic pillar focuses on achieving a **10% annual GDP growth rate,** while the social pillar aims to build a just and cohesive society with social equity and a clean environment. The

political pillar aims to establish a democratic political system that protects individual rights and freedoms.

The Vision is implemented through successive 5-year Medium Term Plans (MTPs). The third MTP, with the theme "Creating jobs, transforming lives for shared prosperity through the 'BETA' plan," emphasizes manufacturing, food security, universal healthcare coverage, and affordable housing.

The threats of climate change pose a significant hindrance to achieving the MTPs and the Kenya Vision 2030. Adverse weather conditions in Trans Nzoia County have led to the spread of pests and diseases, affecting crop production and posing risks to human and livestock health, infrastructure, agriculture, and the economy.

To address these challenges, it is crucial to develop and customize national policy and legal frameworks that focus on mitigation and adaptation actions, as well as early warning and response to disasters. These efforts are aligned with the United Nations' Sustainable Development Goals and the African Union Agenda 2063, which guide socio-economic transformation in the region.

1.2.3.3.National Determined Contribution

In Kenya Climate change is becoming one of the most serious challenges. The country is susceptible to climate-related events, and projections indicate that climate impacts will continue to affect Kenya in the future. In many areas, extreme and variable weather is now the norm. Rainfall is irregular and unpredictable; some regions experience frequent droughts during the long rainy season or severe floods during the short rains. Arid and semi-arid areas are especially vulnerable to these extreme changes, putting the lives and socioeconomic activities of millions of households at risk.

“Kenya seeks to undertake an ambitious mitigation contribution towards the 2015 Agreement **Kenya therefore seeks to abate its GHG emissions by 30% by 2030 relative to the BAU scenario of 143 $MtCO_2eq$** and in line with its sustainable development agenda. This is also subject to international support in the form of finance, investment, technology development and transfer and capacity building”. Kenya’s updated NDC 2020 seeks to undertake an ambitious mitigation contribution towards the Paris Agreement Kenya therefore seeks to abate her GHG

emissions by 32% by 2030 relative to the BAU scenario of **143 $MtCO_2eq$** and in line with her sustainable development agenda Subject to national circumstances, Kenya intends to bear **13% of the mitigation** cost from domestic sources, while **87% of this is subject to international** support in the form of finance, technology development and transfer, and capacity building..

1.2.3.4.Kenya National Climate Change Response Strategy

In 2010, Kenya developed the National Climate Change Response Strategy (NCCRS) to address the impacts of climate change on the country's development. **The NCCRS recognizes the evidence of climate change in terms of temperature and rainfall variations in Kenya and identifies the impacts of climate change on the country.** It also provides recommendations for actions to reduce these impacts and capitalize on the potential benefits of climate change.
The recommended actions outlined in the NCCRS include adaptation and mitigation measures in key sectors, policy and legislative adjustments, institutional changes, climate change awareness and education initiatives, capacity building efforts, and research and technology development for climate change response.

Overall, Kenya recognizes the importance of addressing climate change and has developed strategies and plans to mitigate its impacts and take advantage of potential opportunities. The country aims to incorporate climate change considerations into various levels of governance and promote collaboration among stakeholders to achieve effective climate change response

1.2.3.5.The National Climate Change Action Plan (NCCAP) 2018-2022

The 2nd gen. National Climate Change Action Plan (NCCAP) 2018-2022 was developed pursuant to the provisions of the Climate Change Act, 2016. It contains detailed actions that the country intended to take to tackle climate change from 2018 to 2023. The plan set out to support Kenya's development goals by providing mechanisms and measures to achieve low carbon climate resilient development in a manner that prioritizes adaptation and recognizes the essence of enhancing the climate resilience of vulnerable groups including children, women, youth, persons with disabilities, the elderly and Indigenous People and marginalized and minority communities. The plan specifically seeks to: Align climate change actions in the country with the Government's development agenda, including the Big Four Agenda; encourage participation the private sector, civil society and vulnerable groups within society, including children, women, older members of society, persons with disabilities, youth and members of minority or

marginalized communities; provide the framework to deliver Kenya's NDC for the 2018-2022 period; and, provide a framework for mainstreaming climate change into sector functions at the National and County levels.

1.2.3.6.The National Adaptation Plan (NAP)

The National Adaptation Plan was developed following recommendations and activities resulting from the implementation of the NCCRS and NCCAP 2013-2017. The NAP forms the basis for the adaptation component of Kenya's Nationally Determined Contributions (updated in 2020). The objectives of the NAP are to: Highlight the importance of adaptation and resilience building actions in development; integrate climate change adaptation into national and county level development planning and budgeting processes; enhance the resilience of public and private sector investment in the national transformation, economic and social pillars of Vision 2030 to climate shocks; enhance synergies between adaptation and mitigation actions in order to attain a low carbon climate resilient economy; and, enhance resilience of vulnerable populations to climate shocks through adaptation and disaster risk reduction strategies.

1.2.3.7.The Climate Change Act, 2016

The main objective of the Act is to govern the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya. The Act is to be applied to all sectors of the economy by both the national and county governments. Specifically the Act is to be applied to ensure among other objectives: Mainstreaming of climate change responses into development planning, decision making and implementation; building resilience and enhancing adaptive capacity to the impacts of climate change; formulation of programme and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change; and, mainstreaming and reinforcing climate change disaster risk reduction into strategies and actions of public and private entities.

1.2.4. The Global Climate Change Policy and Legal Framework

The Intergovernmental Panel on Climate Change (IPCC) has noted that Africa is highly vulnerable to climate change. Impacts of particular concern to Africa are related to water resources, food production, human health, desertification and/degradation biodiversity losses.

These impacts are already manifesting in Kenya with shifts in rainfall patterns and extreme weather events expected to have far reaching consequences.

Cognizant of this, the Government has, through the UNFCCC process committed to protect the climate system for the benefit of the present and future generations. Kenya ratified the UNFCCC in 1994 and the Kyoto Protocol in 2005. The country is a key player in the global climate change governance system, and annually participates in the Conference of the Parties to the UNFCCC and Conference of the Parties serving as Meeting of the Parties to the Kyoto Protocol, articulating the national interest and position during international negotiations. The objective of the UNFCCC is set out in Article 2, which states: The ultimate objective of this Convention is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate systems. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

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.

Kenya has also actively participated in regional initiatives to respond to climate change, including the development of the East African Community (EAC) Climate Change Policy, Master Plan, and Strategy, which also inform this National Climate Change Framework Policy. The EAC regional Climate Change Master Plan (2011-2031), indeed, serves as the blueprint to guide regional climate change response measures over the long term. Through this extensive global and regional engagement, Kenya recognizes the imperative of a trans-boundary approach to climate change response in addition to initiatives at the national, county and local levels.

1.3. Purpose of the PCRA report

The purpose of the PCRA is to provide county government decision makers and community members with information relevant in defining their adaptation priorities and plans. The PCRA also provided i**nformation useful to stakeholders to understand vulnerability and exposure to climate risks and how the risks impacted of different segments of the population and their livelihoods**. It identifies major climate risks, historical events sources of vulnerability, the vulnerable groups and priority adaptation strategies to be implemented in response to the identified risks and hazards.

In order to address those risks and hazards, the Financing Locally-Led Climate Action (FLLoCA) Program is **supporting implementation of community prioritized adaptation activities to mitigate climate risks**. Through the PCRA process, communities were consulted to identify: climate change hazards in their wards which are illustrated in the a hazard maps, direct and indirect impacts of the hazards; local climate change responses the communities have adopted over time; and prioritized response actions to incorporate into the county Climate Change Action Plan (CCAP) and the County Integrated Development Plan (CIDP).

1.4. KEY STEPS IN THE COUNTY'S PCRA PROCESS

The PCRA Process was implemented in 6 main steps. As outlined in Figure 1.1 below. The stages are: 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, preparation for county level multi-stakeholder workshop on climate change risk assessment and final report writing as detailed in the section. The PCRA process steps are summarized in the figure 3 below.

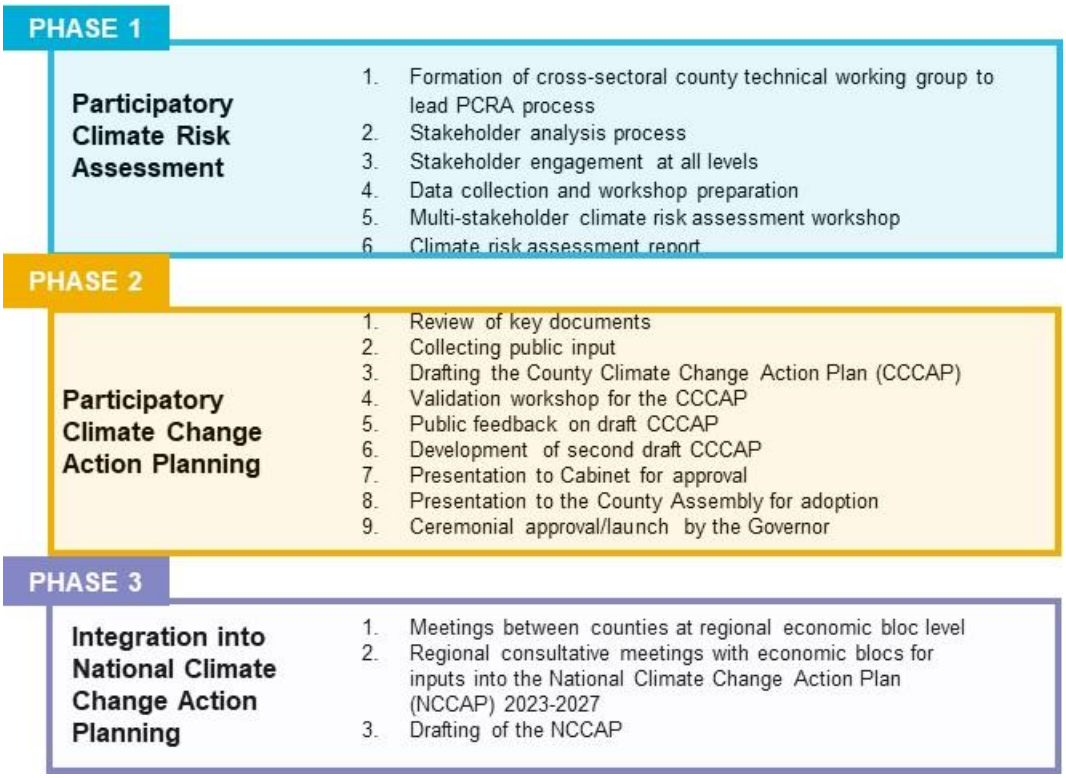


Figure 3: ***Summary of the PCRA Process***

Step 1: Formation of the Technical Working Group for the Participatory Climate Change Risk Assessment

The **technical working group** was formed in January 2023 through **appointment by the County Executive Committee Member** of Water, Environment, Natural Resources and Climate Change. Considerations for appointment to the technical working group were**: Commitment to create time for the exercise, knowledge, skills and experience relevant to the task and gender consideration**. Those appointed to the committee were **county directors and technical officers** in charge of: **Environment and Climate Change, Water, Health and sanitation, Gender and Social Services, Meteorological services, Kenya Forest Services, Public works, livestock production, communication; Civil Society Organization representativ**e were also incorporated intothe task team. In total, the technical working group had 23 members.

This technical working group was supported by a wider consultative group which provided advice through the whole process. The wider group had a broader membership and was representative of the whole society including the Ward Climate Change Planning Committees, Steering Committee and Planning Committee, national government agencies such as NEMA and KMD, Members of the Civil Society organization, academia and members from the Communication department and finance.

Training of the TWG

This step was not envisaged in the original design of the FLLOCA programme design guidelines. But it was recommended after the initial engagement with high level policy makers in the counties during the inception meetings. The TWG was trained for two days to equip the requisite skills required for 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. The training was coordinated by GIZ team, and a special guest; Vihiga County Climate Change Director.

Step 2: Stakeholder Analysis

The technical WG met for two days to identify all key stakeholders that needed to be engaged and developed a strategy/process on how best to engage with each one of them. The stakeholder analysis and identification was done using the criteria that follows: i) Actors formally responsible for climate action and building resilience; ii) Those involved in climate action and responses to climate impacts; iii) Stakeholders with knowledge and expertise relevant to climate action and building resilience, including knowledge on the climate system and climate risks; and iv) Population and individuals impacted by climate change. The ward climate change planning committees (WCCPCs) were be part of the key stakeholders engaged in this process.

The stakeholders analysis by TWG went beyond an analysis of the usual stakeholders and specifically considered all sectors and types of stakeholders, including community based organisations, civil society organisations, grass roots organisations, faith based organisations/representatives, customary/traditional institutions, indigenous groups, local producer groups, local experts, community leaders and representatives (including traditional, spiritual and cultural), business groups and umbrella organisations, youth groups, women groups, representatives of people living with disabilities, and traditionally marginalised and vulnerable groups. Further the TWG considered and identified the groups that are most affected by climate change impacts. The stakeholders that were identified using the criteria explained above as listed in Table 2.

Table 2: Stakeholder in Trans Nzoia County

Entities formally responsible for climate action and building resilience:	**Stakeholders involved in climate action and responses to climate impact:**
● Kenya Forest Service (KFS)	● Ministry of interior

● Kenya Forest Research Institute (KEFRI) ● County department of finance and economic planning ● National Government Directorate of climate change ● Office of the County Surveyor ● Kenya Meteorological Department (KMD) ● County Department of Agriculture, Livestock and Fisheries ● National Environment Management Authority (NEMA) ● County Department of Health ● County Department of Water, Environment, Natural Resources and Climate Change ● Community Forest Association (CFA) ● Water Resource Users Association (WRUA) ● Water Resources Authority (WRA) ● GIZ Kenya ● Ward Climate Change Planning Committees ● Kenya Water Towers Agency (KWTA) ● County Assembly-Environment Committee ● Kenya Wildlife Service (KWS) ● National Disaster Management Agency (NDMA) ● National Government Department of Water, Environment and Natural resources	● Kenya Meteorological Department (KMD) ● County Department of Agriculture and Livestock ● County department of Water, Environment and Climate Change ● National Environment Management Authority (NEMA) ● Kenya Wildlife Service (KWS) ● Kenya Red Cross ● The Nature Conservancies ● County Department of Health Services ● County Department of Finance and Economic Planning ● County Department of Sports, Youth affairs, Culture, Children and Social Services ● Community Forest Association (CFA) ● Water Resource Users Association (WRUA) ● Water Resources Authority (WRA) ● Catholic Diocese of Kitale ● Civil Society Organizations (CSO) VI-Agroforestry, ● National Environment Trust Fund ● GIZ Kenya ● Kenya Forest Research Institute (KEFRI) ● Kenya Water Towers Agency (KWTA) ● Nzoia Water and Sewerage Company ● County Assembly ● Financial Institutions (KCB, Equity, Cooperative Bank) ● Kenya Cooperatives Creameries ● Kenya Seed Company
Kenya Entities with knowledge and expertise relevant to climate action, resilience, including knowledge onclimate systems and climate risks: ● Kenya Forest Service (KFS) ● County Department of Water, Environment, Natural Resources and climate change ● Kenya Meteorological Department (KMD) ● County Department of Agriculture, Livestock and Fisheries ● National Environment Management Authority (NEMA) ● Water Resources Authority (WRA)	**Those impacted by climate change** ● Community (Women, People Living with Disabilities, Youth, IPs & Elderly) ● Farmers ● Learning institutions (students). ● Biodiversity (flora and fauna) ● Infrastructure e.g., roads, telephone lines, electricity lines, water pipes, roofs, etc. ● Public health and Sanitation ● Crops and Livestock ● Land ● Water sources

• Kenya Forest Research Institute (KEFRI) • Kenya Water Towers Agency (KWTA) • Kenya Red Cross • Kenya Agriculture and Livestock Research Organization (KALRO) • Indigenous community • Power and Lighting Company (KPLC)	**Sources of scientific data** • Kenya Meteorological Department • National Museums of Kenya • Directorate of Resource Survey and Remote Sensing • Kenya National Bureau of Statistics (KNBS) • Directorate of Economic Planning and Budgeting • Research and Learning Institutions (KEPHIS, KALRO, KNBS

Table 3: Trans Nzoia County Stakeholders Analysis

High Influence • County Assembly • Financial Institutions • Kenya Power and Lighting Company • Community • KENHA • KERRA	**High Influence - High Interest** • County Department of Water, Environment and Climate Change • Kenya Forest Service (KFS) • Kenya Meteorological Department (KMD) • National Environment Management Authority (NEMA) • County Department of Finance and Economic Planning • County Department of Agriculture, Livestock and Fisheries • County Department of Sports, Youth affairs, Culture, Children and Social Services	• Water Resources Authority (WRA) • Kenya Forest Research Institute (KEFRI) • Kenya Water Towers Agency (KWTA)
Low Influence • Business Community	**Low Influence - High Interest** • World Vision Kenya • Kenya Red Cross • CommunityForest Association (CFA) • Water Resource Users Association (WRUA)	• Ward Climate Change Planning Committees • Civil Society Organizations (CSOs) • CommunityBased Organization (CBO)

Step 3: Stakeholder engagements ward and Sub-County

The TWG approached, mobilized, sensitized and consulted the identified stakeholders drawn from different levels namely the wards, sub-counties and county. Awareness on the PCRA process was created among the stakeholders to extract buy-in. The engagement process reflected the understanding of public participation as a meaningful process of empowerment of local people, by placing them at the centre of decision making. At the sub-county and ward levels, this step also involved obtaining communities' views of local climate risks, vulnerabilities and priorities for climate action investments. Ward and community level stakeholders, including the WCCPCs, were included in the stakeholder consultations.

An averages of 15 participants per ward were engaged including representations from vulnerable community groups (PWD-1, Women rep.-1, Youth rep.-2, CBO rep.-1 and 1 Indigenous Persons where applicable), sub-locations within the ward, CBOs, academia and FBOs.

The process took two days per cluster of wards to collect data from the community. The head of the Climate Change Unit (CCU), County Director of Environment and Climate Change, assisted by the CCU social and environment safeguards directed the whole PCRA engagement process. The output of this step was community action plans.

Step 4: Data collection and County level workshop preparation

In preparation for the county level workshop the TWG appointed a workshop facilitation team which was responsible for leading the plenary and group work sessions during the workshop. Specifically the workshop facilitation team identified the 'table groups' for the workshop group sessions, prepared workshop materials, including the key presentations on the county's socio-economic and climatic contexts during the plenary sessions.

In preparation for the workshop, the technical TWG reviewed all relevant national development, climate and sectoral plans, including the National Climate Change Action Plan 2018-2022, which identified key priority areas to achieve low carbon climate resilient development, and the Kenya Climate Smart Agriculture Strategy 2017-2026 among others. In addition, key county development and sectoral plans, such as the CIDP were reviewed.

An endeavor was made to identify climate resilience investment priorities in the climate risk assessment process that were integrated into the county climate change action plan aligned to other county plans and policies and with the national climate priorities. The TWG also reviewed reports or summaries submitted by the stakeholders following the consultation processes that happened both at sub-county and ward levels. This review process was delivered through table group facilitation teams.

The data from the wards was summarized into reports and risk maps digitized by the GIS unit capturing the main hazards and prioritized response actions per ward and at the sub county level. This was followed by one-day meeting of technical committee to develop the workshop program

and share responsibilities among team members as well as agree on the workshop execution strategy. A concept for the workshop was developed which detailed the background of the exercise, objectives, program and list of invitees.

Step 5: County level multi-stakeholders workshop

The county level multi-stakeholders workshop was convened to: i) conduct a participatory and cross-sectoral holistic assessment of current and likely future climate risks facing the county, exploring exposure, vulnerability and adaptive capacity; and ii) identify robust, broad thematic adaptation investment areas that can address the current and future climate vulnerabilities of different groups.

The workshop was organized in an ordered series of five sessions spread over three days. Each session focused on a different themes which progressively generated data, discussion points and perspectives that contributed to successive sessions. Sessions were designed to be interactive and highly participatory; they were run by an experienced facilitation team selected by the TWG. The sessions ran both plenary and table group mode; typically the session began in plenary with more focused work being done in smaller table groups. See a summary of the workshop in Figure 4 below.

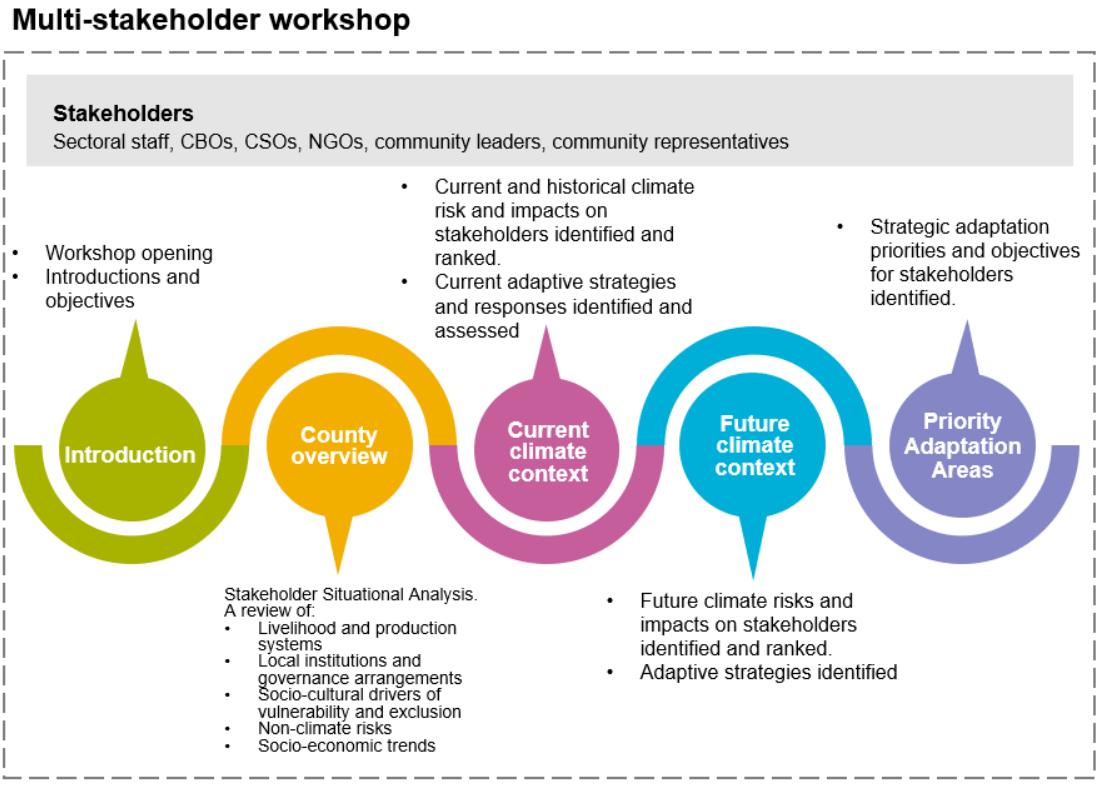


Figure 4: Multi-stakeholders workshop

At the end of the county multi-stakeholders workshop a climate risk profile of the county was developed detailing the current climate context, including key climate hazards and trends, an exploration of the future climate context. Further integrated strategic resilience priorities and objectives for the county were developed.

Step 6: Development of the county PCRA report

The TWG undertook the process of developing a participatory Climate Risk Assessment Report through consolidating all the data collected during the two engagements from the ward engagements to the County level. It took about 1 month and a half cumulatively to develop the report which was finalized by the Directorate of Climate Change.

CHAPTER 2: COUNTY CLIMATE HAZARD PROFILE

This chapter highlights climate information of the county backed with scientific climate trends and risks on different key interest groups within the county. It also provides a summary of the exposure andvulnerability profiles and the spatial breakdown of the climate projections into ward level that links main livelihood and economic sectors.

2.1 Current and Historical Climate Hazards and Trends

The County has a cool and temperate climate with mean maximum (day time) temperatures ranging between 23.4°C and 29.2°C and mean minimum (night time) temperatures ranging between 11.0°C and 13.5°C. The maximum and minimum extreme temperature are recorded in February (about 34.2°C) and January (about 6.5°C) respectively. The mean monthly relative humidity is 67%, ranging from a maximum of 97% in July and a minimum of 35% in January. The mean wind speed within the county is 66.79 km/h or 36.06 knots.

It receives annual rainfall ranging from 1000mm to 1700mm. Western parts of Endebess, Saboti and Kiminini Sub Counties, and North Western parts of Cherang'any Sub County receive the highest rainfall ranging between 1,300mm and 1,700mm per year. The eastern parts of Saboti and Kiminini Sub Counties, southern parts of Kwanza Sub County, western and central parts of Cherang'any Sub County receive moderate rainfall ranging from 1,200 to 1,300mm. The parts of the County that receive the lowest rainfall (1,000mm -1,200mm) are Northern parts of Kwanza Sub County, Eastern parts of Endebess Sub County, South Eastern parts of Cherangany Sub County (Tuigoin) and South Eastern parts of Kiminini Sub County (Waitaluk). Map 1 shows the distribution of annual mean rainfall by Sub County.

The annual rainfall is distributed into three major seasons namely; Long rainfall season- March, April, May (MAM), Intermediate Season- June-July-August (JJA); and short rainfall season- October- November-December (OND). The long and intermediate seasons are more reliable for agricultural production as compared to the short rainfall season. In the recent past, prolonged dry spells, floods and increased incidence of Vector, Pests and diseases hazards have increased in frequency and complexity, probably exacerbated by climate change. Uncertainty about the growing season, including about the onset and end of the rainy season, moisture stress, and

excess rainfall are the main climatic hazards that affect productivity, thus compromising food security in the County.

Trans Nzoia county experiences two continuous growing seasons: the long and the short rains. The driest months are December through February. The county receives a large amount of rainfall – up to 2000mm in its western region. Mean temperatures range from 12-25^{o}C. The rainfall trends in the past and in the future do not show significant changes for the long rainy season. However, for the short rainy season, the rainfall will increase in the near future (2023-2040) and will continue to do so by 2060. The trend in temperature show an increase in the annual mean temperature for both seasons and for both projections (2023-2040 and 2041-2060).

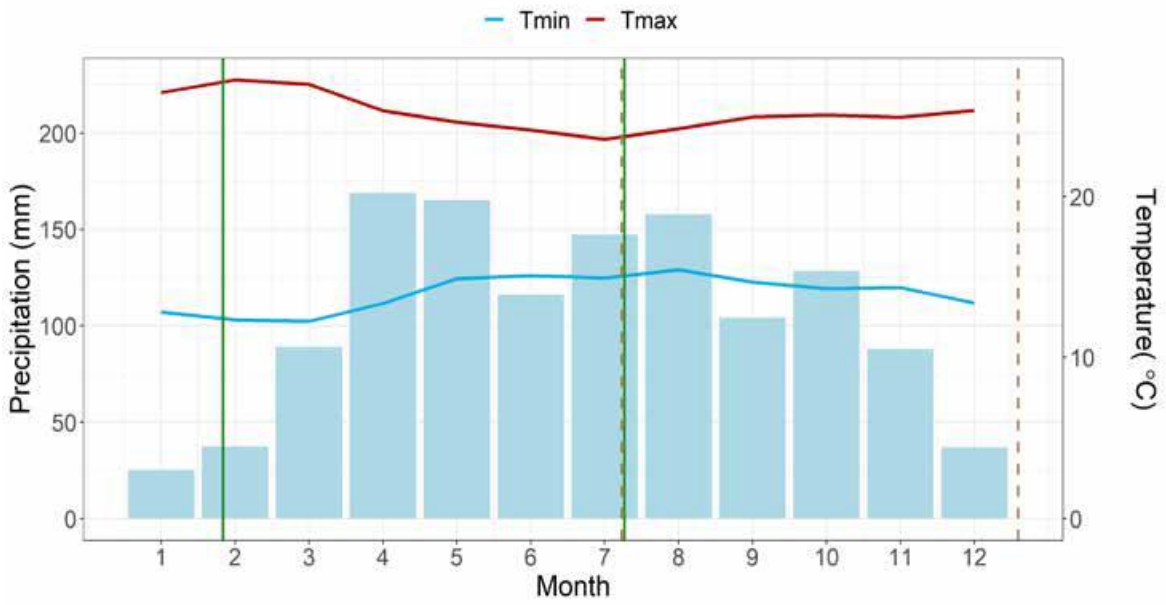


Figure 5: Average historical monthly mean temperature and precipitation over the last 30 years (1985-2015) for Trans Nzoia County.

The long rainy season is the 100-day wettest period from January to June, while the second, short rainy season is the 100-day wettest period from July to December. Bars represent total monthly precipitation, whereas the red and blue lines represent maximum and minimum monthly mean temperatures, respectively.

The number of consecutive dry days (CDD) serves as a measure extremely low precipitation and

incidences of seasonal droughts. The number of CDD in the long rainy season is expected to slightly increase from 3 to 8. In the short rainy season, the number of CDD is expected to lessen by up to 5 days. The maximum 5-day precipitation (P5D) serves as an indicator of flood risk and is projected to increase from 6mm to 13mm. In the second season, the maximum 5-day running average precipitation is expected to increase by 10-16mm throughout Trans Nzoia County. The overall increase in the P5D indicate a greater flood risk throughout the county. The 95th percentile of daily precipitation in the long rainy season will slightly increase by around 3mm in the eastern and western regions, while in the short rainy season, it will increase by 10-16 mm throughout Trans Nzoia County. This indicator is linked with erosion risk.

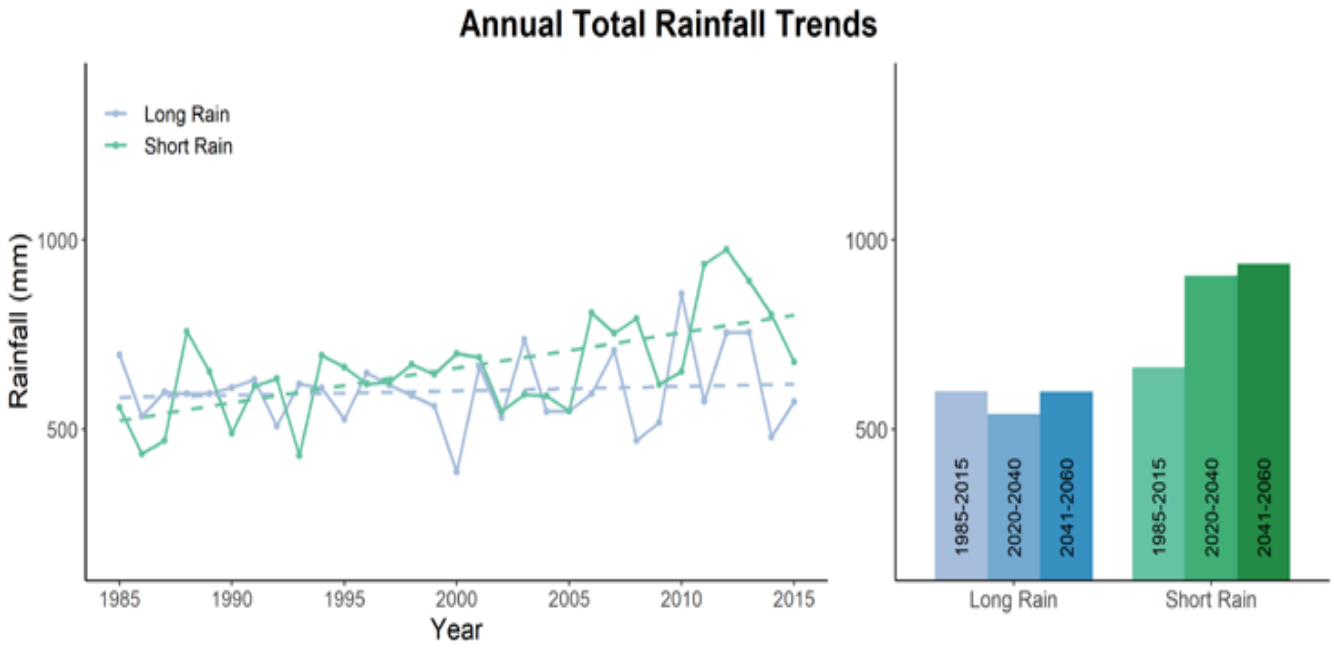


Figure 6: Historic (1985 - 2015) and future rainfall trends (2020-2041 and 2041-2060

There is no expected change in heat stress in Trans Nzoia County in either season, but moisture stress, which serves as an indicator of available moisture for plants, is projected to increase by about 15 days in almost every region of the county during the long rainy season. On the other hand, moisture stress will decrease by up to 10 days in the short rainy season. Higher values of moisture stress negatively affect the vegetative growth of crops during the growing season. An early start to the long rainy season western regions, where the season will be 20 days shorter. This change in the start of the growing season will be replicated in the short rainy season with

the number of days varying from 40 to 90 days. The length of growing period (LGP) is estimated based on the period when climatic conditions are suitable for crop growth. A significant reduction in the length of the long and short rainy seasons is predicted; they may become 20-70 days shorter. A shorter length of LGP will have serious implications for farming because current varieties will not have sufficient time to meet plant growth requirements.

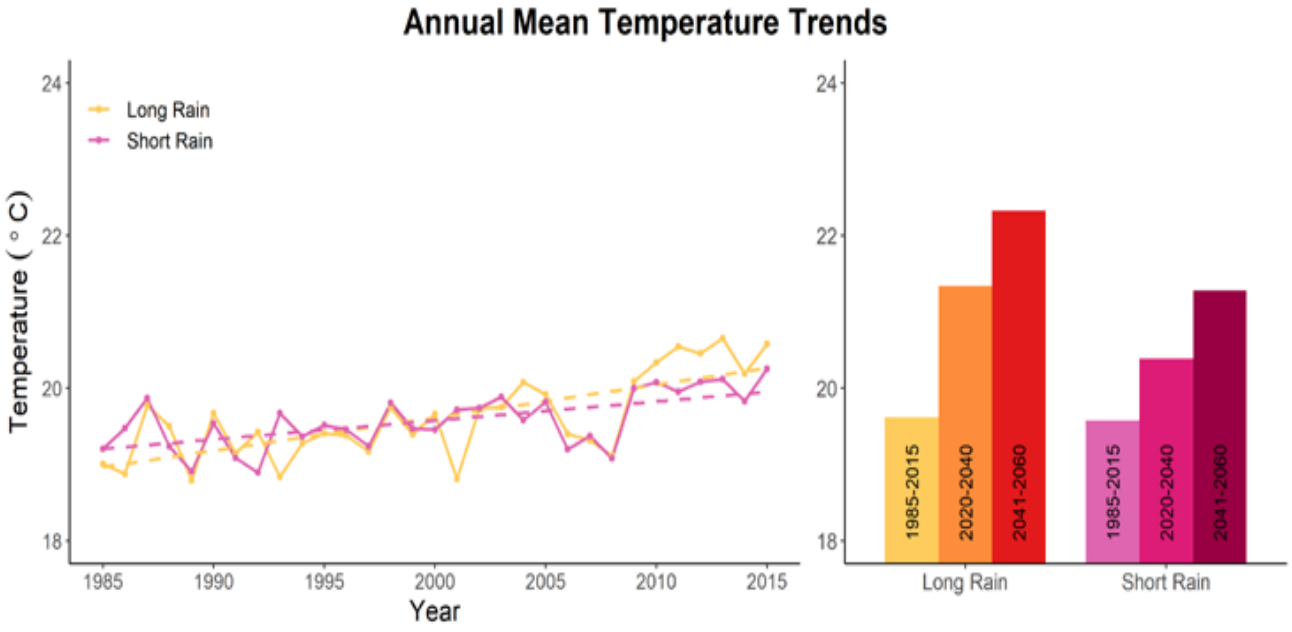


Figure 7: Historic (1985 - 2015) and future temperature trends (2020-2041 and 2041-2060)

2.2 Exposure and Vulnerability Profiles of the county

Exposure and Vulnerability is multi-dimensional and differential – that it varies across physical space i.e. the highlands and among and social groups; scale-dependent with regard to space and units of analysis such as individual, household, region, or system; and dynamic – characteristics and driving forces of vulnerability change over time. There are many interactions between society and environment that make people of Trans Nzoia County vulnerable to extreme events and highlight the vulnerability of ecosystem services.

The environmental dimension of vulnerability deals with the role of regulating ecosystem services and ecosystem functions, which directly impact human well-being, particularly for those social

groups thatheavily depend on these services and functions due to their livelihoods in the county.

The degradation of ecosystem services and functions can contribute to an exacerbation of both the natural hazard context and the vulnerability of people. The erosion of ecosystem services and functions can contribute to the decrease of coping and adaptive capacities in terms of reduced alternatives for livelihoods and income-generating activities due to the degradation of natural resources. Additionally,a worsening of environmental services and functions might also increase the costs of accessing these services, for example, in terms of the increased time and travel needed to access drinking water in rural communities affected by droughts or floods.

Table 4 : ***The Most Common Climatic Hazards in Trans Nzoia County***

SUB- COUNTY	**KEY HAZARDS**
Kiminini	Prolonged dry spell
	Floods
	Erratic rainfall
Kwanza	Prolonged dry spell
	Floods
	Emergence and Increase of Pests & Diseases
Saboti	Prolonged dry spell
	Wind Storms
	Floods
Endebess	Wind storms
	Prolonged dry spell
	Erratic rainfall
Cherangany	Emergence and Increase of Pests & Diseases
	Prolonged dry spell
	Wind Storms

Table 5: Key illustration of Agriculture as a source of livelihood affected by key hazards in Trans Nzoia County

Hazard	Impacts	Vulnerable groups
Prolonged dry spell	Crop failure Reduced pasture Reducing water accessibility & supply	Women Youth Elderly Indigenous Persons PWD
Erratic rainfall	Reduction of pasture Crop failure	
Floods	Crop damage Damage of property Impact on human health	
Emergence and Increase incidents of Vectors, Invasive species, Pest and Diseases	Crop failure Increased cost of living Reduced income	

2.3. Differentiated impacts of climate trends and risks

The level of devastation due to dry spells and floods are becoming increasingly severe with loss of livelihoods and negative impacts to key sectors within the County. Farmers have experienced an upsurge in pests like the fall armyworm, and they have attributed disease incidences hitherto unheard of in the County to changes in the weather patterns. Farmers have also experienced additional occurrences of unusually heavy rainfall, which have led to flooding along the River Sabwani in Kwanza sub-county that displaced people, destroyed crops, and caused losses in livelihoods. Excess rainfall has resulted in total failure of some crops, such as beans. In the same vein,farmers have experienced increasing amounts of rainfall in the short rainy season, a departure from what has been happening historically. This has led farmers in some parts of the County to start planting twice a year. Due to the changing weather patterns, farmers have started cultivating crops that were hitherto not grown, such as sorghum. Farmers have also reported low temperatures in areas suchas Cherangany or high temperatures near Kiminini.

2.3.1. Summary of differentiated climate exposure and vulnerability of key groups

Climate change impacts different groups of people in unique ways and certain populations are more vulnerable and exposed to its effects than others in Trans Nzoia County. Here is a summary of differentiated climate exposure and vulnerability of key groups:

Women.

Women often experience disproportionate vulnerability to climate change due to existing gender inequalities. They tend to have limited access to resources, education and decision making power which hampers their ability to cope with and adapt to climate impacts. Additionally, women often carry burden of water and food scarcity, increased workload and health risks resulting from climate change.

Youth

The youth population is particularly vulnerable to climate change as they will inherit the long-term consequences of degradation. They may face challenges in terms of disrupted education, limited employment opportunities especially in rain dependent farm and agricultural organizations e.g. Kenya Seed Company, ADC, Mt Elgon flowers among others and negative health impacts due to dry spells, natural disasters and spread of vector borne diseases.

People Living With Disabilities [PLWDS]

They face unique challenges in adapting to climate change. For instance during evacuation, they may face challenges in accessing evacuation routes and other critical services during extreme weather events. Most infrastructures are not designed to accommodate their specific needs making it difficult for them to move to safer locations or receive necessary assistance.

Marginalized and minority groups

People face differentiated climate exposure due to combination of social, economic and political context. Indigenous people (Sengwer and Ongiek) mainly depend on natural resources for their livelihoods which are sensitive to climate change impacts, which led to depletion of the resources forcing the to move longer distance in search of the resources such as water, firewood among other key resources.

2.3.2. Major livelihood, natural and economic system affected by impacts of climate trends and risks

Agriculture is the main source of livelihoods for the people of Trans Nzoia County. Largely the people of trans Nzoia practice rainfed agriculture which is highly sensitive to climate change. The populace in Trans Nzoia takes part in on-farm and off-farm activities. In Trans Nzoia County, 63% of household heads were engaged in crop growing or livestock rearing as their primary occupation, while 13% held formal salaried employment in both government and non-government positions. About 8.3% were self-employed. Most of the households (80%) have only one source of income (ASDSP 2014).

The major land uses in Trans Nzoia County are agricultural activities – farming crops and keeping livestock – and forestry. Arable land covers 1980 km2 , representing 79% of the total land area, while non-arable land accounts for 21%; there is no water mass. The non-arable land includes the Mt. Elgon forest, which measures 169 km2. Trans Nzoia County is endowed with two forests that are found on the two water towers, namely Mt. Elgon and the Cherang'anyi Hills.

Farmers in Trans Nzoia County are prone to experience the impacts of climate variability due to various economic, infrastructural, institutional, and policy related factors. The elevated poverty rates in Trans Nzoia County coupled with the high costs of climate change mitigation technologies make farmers more vulnerable. Poor infrastructure also heightens their vulnerability by negatively affecting access to inputs and markets for their products, especially when the county is affected by excess rainfall. Biophysical factors such as location, altitude, and terrain may also worsen the vulnerability of farmers by affecting the amount of rainfall received, erosion rates and flooding. For instance, Trans Nzoia County contains areas such as the Cherang'any Hills that are prone to soil erosion due to heavy rainfall and steep terrain. Sub optimal institutional capacity has led to poor access to information and low uptake of technologies by farmers. Meanwhile, a lack of policies has negatively affected farmers' efforts to acquire inputs and market produce. Culturally and socially, women are more vulnerable to climate impacts because of low access to production resources.

2.4. Spatial Distribution of risks

The spatial distribution of climate hazards across the 25 wards is determined by the prevailing landscape terrain, type of soil and the human activities e.g. farming .This section outlines the climate hazards and their impacts per ward. .

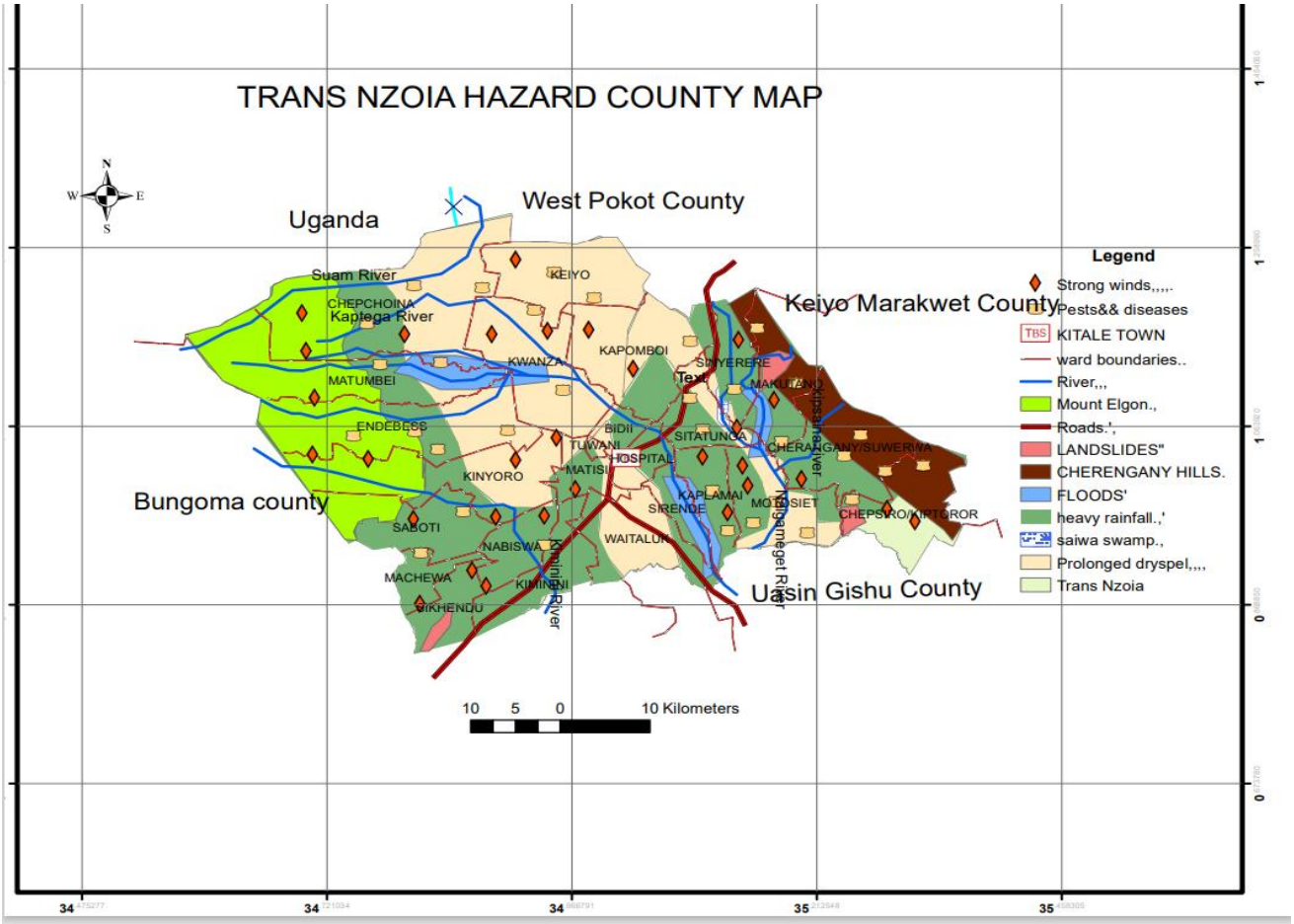


Figure 4: Trans Nzoia County Climatic Hazard Map (Source: GIS team-PCRA process)

2.4.1. Kiminini Sub-County Hazard Distribution

Kiminini has 6 Wards; Waitaluk, Nabiswa, Kiminini, Hospital, Sikendu and Sirende wards. The main climate hazards are: prolonged dry spell, floods and erratic rainfall. As a result of the climatic hazards, shortage of pasture, crop failure, landslides, low yields in the farms, destruction of propertiesand death are frequently experienced.

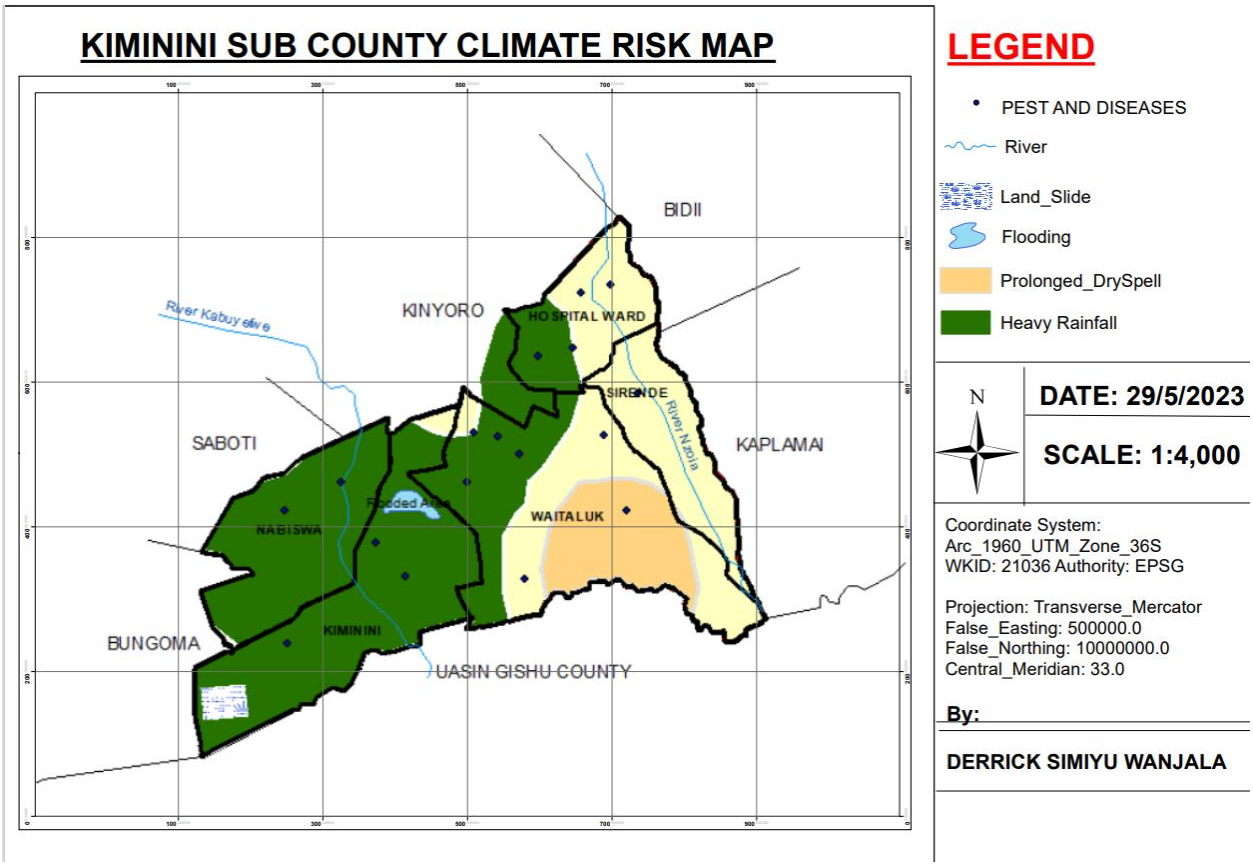


Figure 5: Kiminini Sub-County Climatic Hazard Map (Source: GIS team-PCRA process)

2.4.2. Saboti Sub-County Hazard Distribution

Saboti has of 5 Wards; Saboti, Matisi, Machewa, Tuwan, Kinyoro wards. The main climate hazards are: prolonged dry spell, windstorms and floods. As a result of the climatic hazards, shortageof pasture, water scarcity, crop failure, landslides, low yields in the farms, destruction of properties, wild fires, soil erosion, increased water borne diseases, increased temperature and water pollutionare frequently experienced.

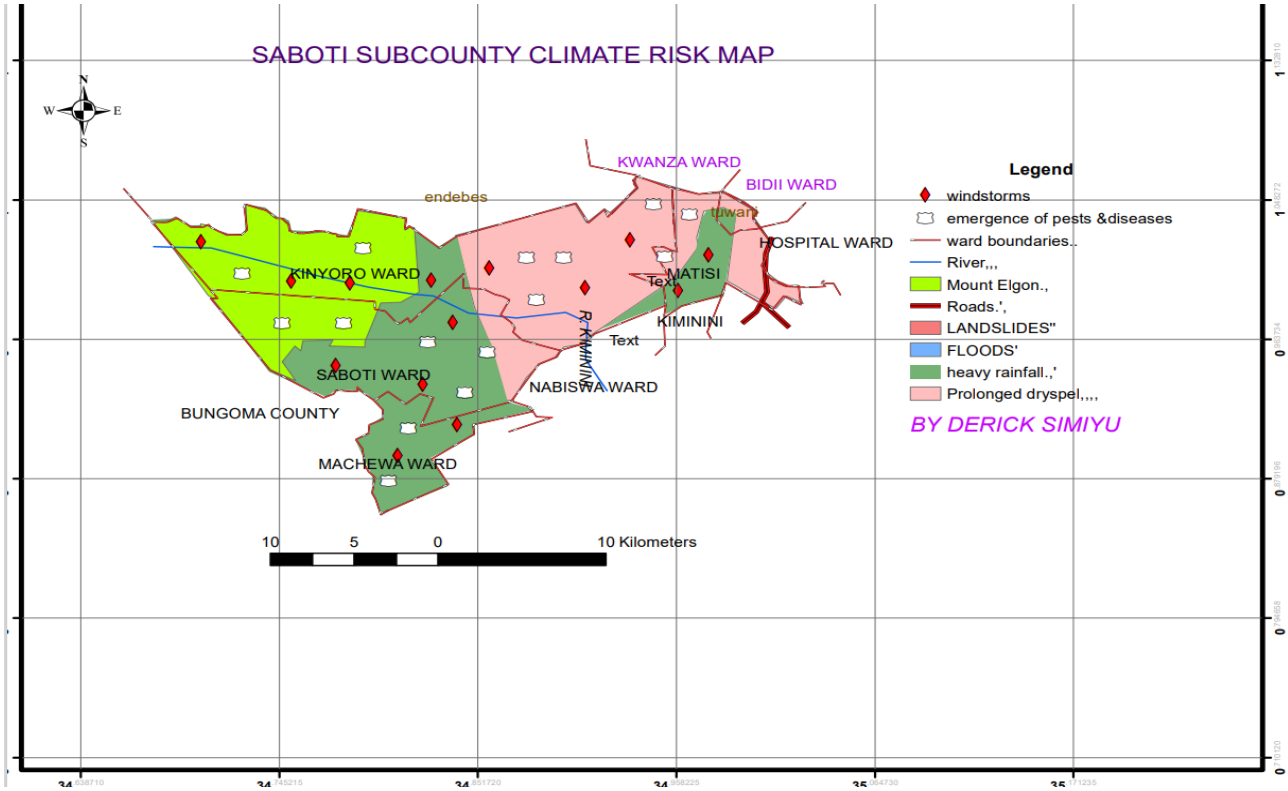


Figure 6: Saboti Sub-County Climatic Hazard Map (Source: GIS team-PCRA process)

2.4.3. Endebess Sub-County Hazard Distribution

Endebess has 3 Wards; Endebess, Chepchoina and Matumbei wards. The main climate hazards are: windstorms, prolonged dry spell and erratic rainfall. As a result of the climatic hazards, mudslides, low farm production, crop failure, landslides, floods, destruction of properties, water scarcity, reduced pasture availability, human-wildlife conflict, airborne diseases and wind erosion are frequently experienced.

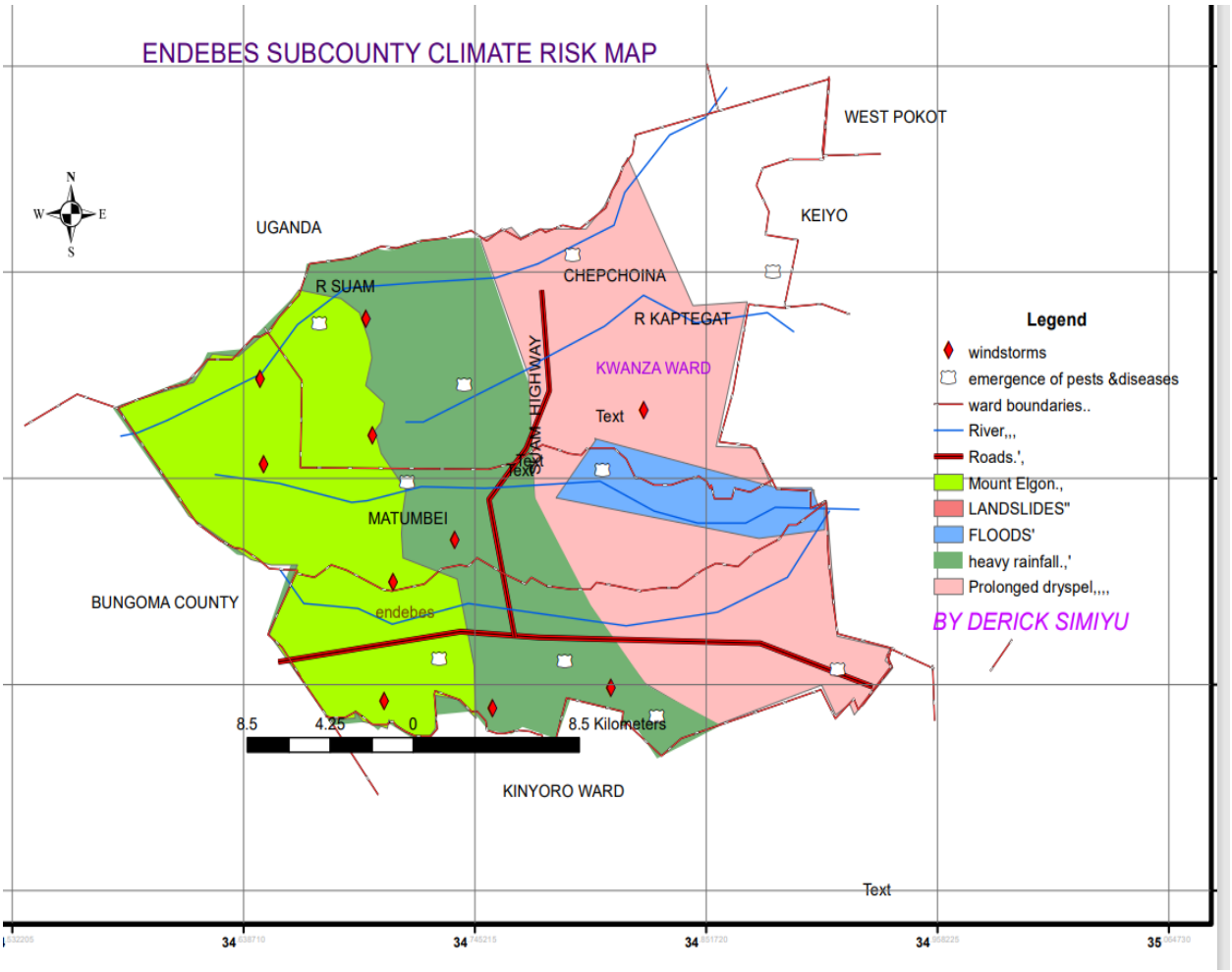


Figure 7: Endebess Sub-County Climatic Hazard Map (Source: GIS team-PCRA process)

2.4.4 Cherangany Sub- County Hazards Distributions

Cherangany Sub County has 7 Wards; Sitatunga, Motosiet, Sinyereri, Makutano, Chepsiror/Kiptoror, Cherangany/Suwerwa and Kaplamai. The main climate hazards are: emergence and increase in Vector, Pests and diseases, floods, prolonged dry spells and windstorms. As a result of the climatic hazards, soil erosion, loss of livestock, malnutrition, reduced crop and livestock productivity, shortage of pasture, crop failure, and reduced water levels are frequently experienced. Similarly, there have been increase in vectors and human diseases e.g. Malaria and Neglected Tropical Diseases (NTD), which affects learning.

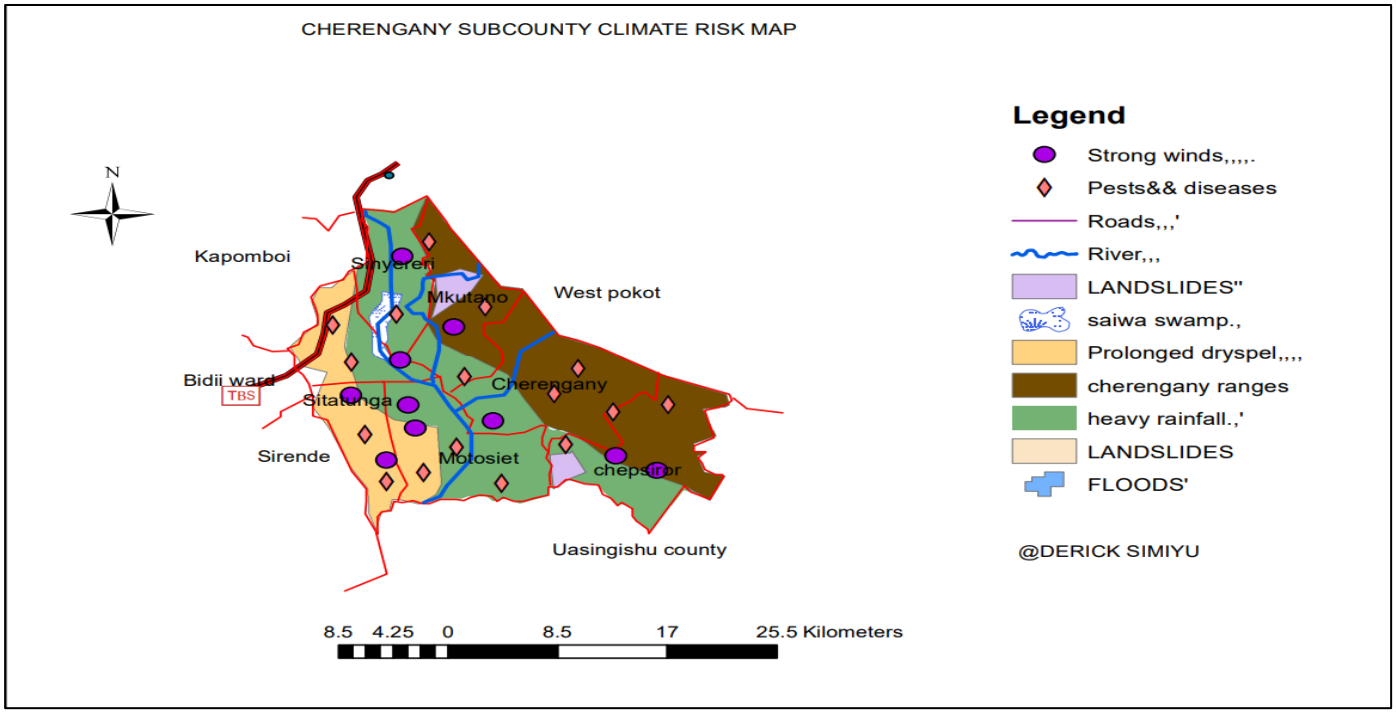


Figure 8: Cherangany Sub-County Climatic Hazard Map (Source: GIS team-PCRA process)

2.4.4. Kwanza Sub-County Hazard Distribution

Kwanza Sub County has 4 Wards; Kwanza, Bidii, Kapomboi and Keiyo wards. The main climate hazards are prolonged dry spell, strong winds and intense rainfall. As a result of the climatic hazards, shortage of pasture, crop failure, landslides, floods, low yields in the farms, destruction of properties, reduced quantities of water and pollution in streams, boreholes and springs are frequently experienced. These hazards also lead to outbreak of human diseases e.g. Cholera and Typhoid.

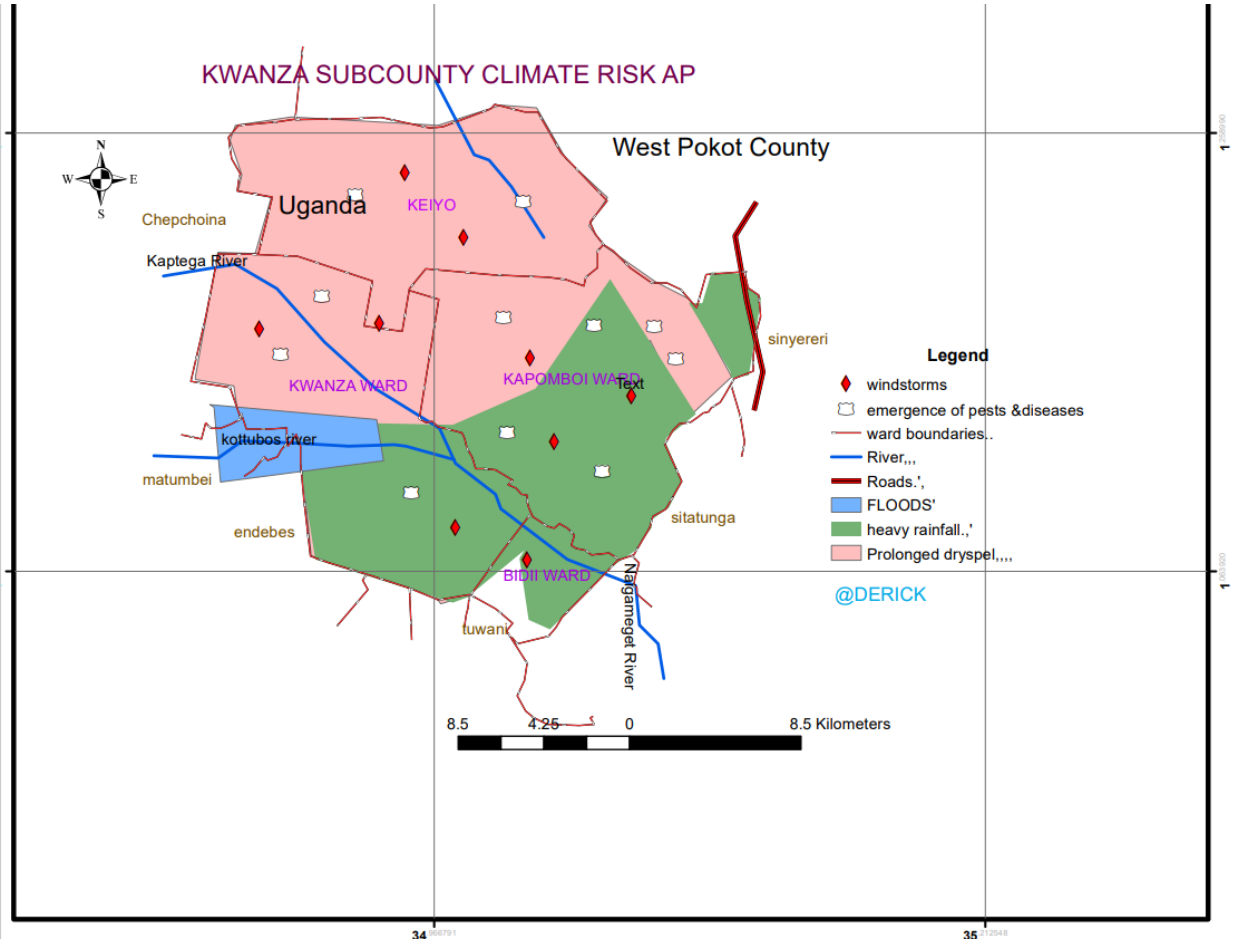


Figure 9: Kwanza Sub-County Climatic Hazard Map (Source: GIS team-PCRA process)

CHAPTER 3:

3.0 TRENDS AND CLIMATE PROJECTIONS FOR TRANS NZOIA COUNTY

3.1. National and Downscaled Climate Change Projections

The Kenyan climate is changing as proven by changes in temperature and precipitation. Temperatures in Kenya are projected to continue rising by 1.7°C by the 2050s and by approximately 3.5°C at the end of the century. Additionally, the number of hot days and nights will increase, with 'hot days' projected to occur on 19%–45% of days by mid-century. Hot nights are expected to increase more quickly, projected to occur on 45%–75% of nights by mid-century and on 64%–93% of nights by the end of the century. Cold days and nights are expected to become increasingly rare.

Across all emissions scenarios, temperatures in Kenya will continue to rise. Under a high-emission scenario (RCP 8.5), average temperatures are expected to increase rapidly by mid-century. Increased heat and extreme heat conditions will result in significant implications for human and animal health, agriculture and ecosystems. The mean annual temperatures trends show an increase since 1985 for both seasons and these will continue in the future.

Rainfall or Precipitation is projected to remain highly variable and uncertain. However, average rainfall is expected to increase by mid-century, particularly during the 'short rains', which occur between October and December. Extreme rainfall events are also expected to increase in frequency, duration and intensity and the proportion of heavy rainfall that occurs in heavy events will increase. However, the period between heavy rainfall events may increase. Importantly, rainfall in the arid zones is generally projected to decrease. Annual average precipitation is expected to increase slightly by the end of the century under a high emissions scenario.

Similarly, these National Climatic Changes are reflected in regional climatic changes such as that of the Lake Victoria Basin of which Trans Nzoia County is part of. The overall climate of the region is becoming hotter and drier from recent observations (1981 -2010). The annual precipitation trends for the region are declining indicating a 40 -50 % variation in a 10-year cycle of dry and wet periods from the 1930s.

3.2 County Future Climate Scenarios

Recent trends show that in the coming decades, Kenya will continue to face significant pressure due to both climate change and natural stressors, and this will have greater negative impacts on socio-economic development including food security and livelihoods. Understanding the impacts of these stressors is an important step to developing coping and adaptation strategies at every level. Trans Nzoia county is not only the breadbasket for Kenya but also host to two large water towers of Mt. Elgon and Cherangany which play a critical role in supplying ecosystems services such as water supply, timber and non-timber forest products and regulating services such as climate and water quantity and quality. The assessment of the vulnerability of the county to climate change, adopted the IPCC AR4 framework that defines vulnerability as a function of exposure, sensitivity, and adaptive capacity. The historical trends in rainfall indicate a declining rainfall trend during the March-April-May (MAM) main rainy season, while the October-November-December (OND) short rainy season shows an increase. The temperature patterns are consistent with the domain having a common rising trend with a rate in the range of 0.3°C to 0.5°C per decade.

The projected changes in rainfall, maximum temperatures, and minimum temperatures based on the RCP2.6 and RCP4.5, scenarios have been analyzed for future time slices—2030s (2016-2045), 2050s (2036-2065) and 2070s (2056-2085) to provide information on the expected magnitude of the climate response over each time window.

3.2.1. Rainfall

Under each of the three different scenarios and three future time periods, the projected changes in the annual rainfall component show relatively little change compared to the projected changes in the seasonal rainfall components. The short rains (OND) are projected to increase over most parts of the county under all the three scenarios. In contrast, the long rains (MAM and JJAS) are projected to decrease over most of the region. The projected annual rainfall shows a tendency to increase over the western and south-eastern part of the county and decrease over northeast.

3.2.2. Temperature

The projected changes in maximum and minimum temperatures for the three scenarios (RCP2.6, RCP4.5 and RCP8.5) have been analyzed for three future time slices of 2030s 2050s and 2070s. The results show that almost all areas of the county will experience a warming trend. The

expected warming extent is greatest during MAM and JJAS seasons and least during the short rains (OND). By the 2030s, annual minimum temperatures are anticipated to be 1.0˚C to 1.5˚C higher under the RCP2.6 and RCP4.5 scenarios but 1.5˚C to 2.5˚C higher under the RCP8.5 scenario over most parts of the county, with slightly less warming in the Mt. Elgon area. By 2050s, annual minimum temperatures are expected to be 1.5˚C to 2.0˚C higher under the RCP2.6; 2.5˚C to 3.0˚C higher under the RCP4.5; and 3.0˚C to 3.5˚C higher under the RCP8.5 scenarios over most parts of the county, with slightly less warming expected in the Mt. Elgon area. The greatest potential warming will likely occur in the JJAS season. The projected time series of annual maximum and minimum temperatures have similar variation tendencies as the emission pathway. For RCP2.6, the temperature continues to rise until 2050 and begins to cool slightly thereafter. For RCP8.5, the temperature continues to rise with the ongoing increase of radiative forcing. There are indications that the minimum temperature is warming faster than the maximum temperature; this suggests that the gap between the maximum and minimum temperatures will likely be small in the future, compared to the present period. Moreover, the temperature increases over Cherangany Forest are higher than over Mt. Elgon. For example, by 2100, the projected increase in the annual minimum temperatures will likely be 6˚C higher over Cherangany Forest under the RCP8.5 scenario relative to the base period, but the projected increase in the annual minimum temperature over Mt. Elgon will likely be 5.4˚C to 5.7˚C.

CHAPTER 4

4.0 ANALYSIS OF EXISTING RESILIENCE /ADAPTATION STRATEGIES TO CURRENT AND FUTURE CLIMATIC RISKS

4.1. Overview of Existing Adaptation/Resilience Strategies and Their Effectiveness to Current Climate Risks

This section presents the strategies that various stakeholders are currently implementing within the county to address the climate related risks and hazards. The strategies are aimed at supporting livelihood strategies pursued by the majority of the population such as farmers and traders. The prevailing climatic hazards in the county mainly are prolonged dry seasons that lead to water scarcity, drying up of crops and shortage of animal feed. On the other hand, intense rainfall leads to soil erosion, landslides, floods and crop failure. Emerging vectors, pests and diseases result to loss of crops, livestock and human lives.

There are adaptation strategies applied by the different groups as outlined in the table below. For instance, on pests and diseases, farmers practice crop rotation and use integrated pest and disease management, which are effective strategies. Some of these strategies are more effective compared to others for the different hazards. In order to make the adaptation strategies more effective, there is need for improved access and use of climate information; capacity building through strengthened extension services and better coordination between actors for optimal outcomes.

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

As in section 4.1 above, various adaptation strategies are used in addressing the identified climate hazards. These strategies vary in their effectiveness as assessed during this process. The ranking was done by popular classification which considered the cost of the strategy, current rate of use, and its technical/operational effectiveness. This was done from community consultation at the ward level; county multi-stakeholder climate risk assessment and further review and input by technical team at the county level. Below is a summary of the adaptation strategies brought forward by the communities in the 25 wards of the county and the sectors linked with them.

Table 6: Effectiveness of the Adaptation strategies

Risk/ Hazard	Resilience/ Adaptation Strategy	Factors that support the proposed strategy	Factors that undermine (resources that they do not have)
Prolonged dry spell	Irrigation agriculture Short season crop Agroforestry practices Crop diversification Water harvesting and storage Capacity building Growing of environmental friendly trees. Sustainable livestock practices such as vaccination	Availability of arable Land Availability of technologies and resource persons Political will Annual allocation of Budget towards climate change interventions Good will from development partners Availability of Policy and Legal Framework	Inadequate Funds Inadequate capacity Building Limited political will
Floods	Water storage and harvesting Solid and liquid waste management Increased weather forecast information Short term migration Afforestation and Reforestation Flood control structures Community sensitization	Availability of arable Land Availability of technologies and resource persons Political will Annual allocation of Budget towards climate change interventions Good will from development partners Availability of Policy and Legal Framework	Inadequate Funds Inadequate capacity Building Limited political will
Emergence and Increase of Vector, Pests and Diseases.	Reactive measure such as treatment and application of pesticides. Pro-active such as vaccination and issuance of nets to pregnant women Capacity building	Availability of arable Land Availability of technologies and resource persons Political will Annual allocation of Budget towards climate change interventions Good will from development partners Availability of Policy and Legal Framework	Inadequate Funds Inadequate capacity Building Limited political will
Wind Storms	Climate Smart Agriculture Wind tapping mechanisms Afforestation & Reforestation	Availability of arable Land Availability of technologies and resource persons Political will Annual allocation of Budget towards climate change interventions Good will from development partners Availability of Policy and Legal Framework	Inadequate Funds Inadequate capacity Building Limited political will

CHAPTER 5

5.0: COUNTY CLIMATE STRATEGIC ADAPTATION INVESTMENT/ACTION PRIORITIES

The main climate risks identified across the county in the five sub counties are prolonged dry seasons, floods and increase and emergence of Vector, Pests and disease. The climate hazards in the county, prioritized at the ward level, were presented during the County Level Multi-stakeholder workshop in the view of the current and projected climate outlook. Being followed by the sector-wise identification and prioritization of the response strategy for the identified climate risks. This section presents the prioritized strategies for addressing climate risks and their impacts in four priority areas namely water, agriculture, environment and disaster management. The strategies are summarized in the table below.

Table 7: Sectors Specific Adaptation Strategies

Prolonged dry spell			
Water	**Agriculture**	**Environment**	**Others (Disaster management, health, energy and infrastructure services)**
• Construction of ground and surface climate proofed water harvesting and storage infrastructures e.g. water dams/pans/boreholes. • Rehabilitation of the existing water harvesting and storage infrastructures such as dams/pans. • Protection and conservation of riparian/catchment areas such as wetlands, along river banks and springs. • Enhanced capacity building of the community/stakeholder on climate smart water management practices either for	• Promote Climate smart agriculture through: a) Conservation Agriculture; b) Irrigation farming; c) Regenerative agriculture; and d) Crop diversification (mixed cropping/drought resistant crops/short season crops). e) Vertical Farming technology • Promotion of agri-nutrition • Capacity building of stakeholders/community on climate smart agricultural initiatives. • Water harvesting and storage (farm ponds and pans) • Promote climate adaptive livestock	• Formulation, enactment and Enforcement of relevant environmental county laws. • Capacity building on sustainable environmental management practices. • Capacity building to promote biodiversity protection & conservation in protected areas like Saiwa swamp. • Promote growing of environment friendly tree species • Promote nature based solutions e.g. community tree nurseries (fruits and non-fruits trees) bee keeping, ecotourism, protection of catchment, agroforestry, green spaces	**Disaster management** • Timely dissemination of climate information • Enhance early warning system in forested areas. • Capacity building on disaster preparedness and management • Equip the disaster management unit • Enact and enforce disaster management county laws **Health** • Capacity build CHVs on case identification and management • Enforcement of waste management county laws • Provide confirmed disease case management kits to CHVs

domestic/agricultural/industrial use. • Enhance roof water catchment. • Enact and enforce county laws on protection of water catchment areas	management practices through: a) Climate Adaptive breeds; b) Pasture/fodder/feeds production, storage and conservation. c) Livestock housing • Promotion of agroforestry practices (Multi-purpose Trees and Shrubs-MPTs e.g. calliandra, sesbania, gliricidia).		**Energy and Infrastructure** • Climate proofing of existing infrastructures. • Construction of climate proofed infrastructures • Promotion of green/clean/alternative energy sources to minimize deforestation e.g. biogas, solar energy, and clean stoves/jikos.
Floods			
Water	**Agriculture**	**Environment**	**Others (Disaster management, health, energy and infrastructure services)**
• Enhancing surface overflow Rain water harvesting and storage through construction/rehabilitation of water pans, ponds, tanks and dams • Construction of Flood control structures such as water ponds, pans, dams, Gabions, Cut-off drains and terraces • Enhance access to clean and safe water through pipeline extension and water treatment. • Early flood warning systems from hydrological forecast • Training of Divers • Improve solid and liquid waste management • Community water treatment • Education and awareness campaigns on impacts of climate change on water resources and sustainable water management practices.	• Promote agroforestry (agri-silviculture, silvopastral) • Promote Climate smart agriculture through: a) Conservation Agriculture (gabions, cut off drains, terraces, farm ponds); b) Regenerative agriculture; and c) Crop diversification (mixed cropping/drought resistant crops/short season crops). • Promotion of fish farming e.g. along river Sabwani • Capacity building on floods control and management measures • Integrated soil fertility practices. • Promote climate adaptive livestock management practices through: a) Climate Adaptive breeds; b) Pasture/fodder/feeds production, storage and conservation. c) Livestock housing	• Proper integrated waste management to minimize clogging of drainage systems and contamination of the environment. • Promote nature based solutions e.g. tree nurseries (fruits and non-fruits trees) bee keeping, ecotourism, protection of catchment, agroforestry, green spaces • Capacity building on effects of encroachment of riparian land, wetlands and deforestation • Enforcement of existing policies in management and conservation of riparian reserves and wetlands	**Disaster Management** • Early warning systems • Timely dissemination of climate information • Capacity building and awareness Creation on disaster response during floods. • Mapping of flooding hotspots. • Operationalization of the County Disaster Management Unit • Review and enactment of the draft County Disaster Management Bill. **Infrastructure** • Enhance implementation of spatial plans • Climate proofing of existing infrastructures. • Construction of climate proofed infrastructures **Health** • Community water treatment Capacity build community on water treatment, food storage, sanitation, nutrition and housing • Put in place contingent measures for disease prevention and control.

Increased incidents of vector, invasive species, pests and diseases			
Water	**Agriculture**	**Environment**	**Others (Disaster management, health, energy and infrastructure services)**
• Promotion of nature based solutions to reduce pollution of water sources from agrochemicals. • Enhance protection of riparian areas • Improved solid and liquid waste management. • Water treatment • Capacity building on water treatment, solid and liquid waste management	• Enhance timely/routine vaccination. • Capacity building on prevention and treatment of pests and diseases • Promote Crops & Livestock Insurance • Integrated pest management practices e.g. use of allelopathic plants like Sunflower to control weeds. • Promote regenerative agricultural practices such as Integrated Soil fertility practices and organic pest/disease control methods, Phytosanitary measures among others. • Control trans boundary movement on crop produce and livestock. • Promotion of resilient/adaptive livestock species to pests and diseases • Developing crop and livestock pest and disease contingency plan. • Enhance farmers disease and pest surveillance actions.	• Promotion of integrated pest & disease control (cultural, biological and organic) allelopathic plants e.g. Sunflower • Incorporation of research programs to conserve existing biodiversity • Enhance surveillance of invasive species • Mechanical control of invasive species and promoting their utilization • Strengthen capacity on livelihood diversification and planting of alternative tree species	**<u>Disaster Management</u>** • Early warning systems • Developing human disease contingency control and surveillance plan **<u>Health</u>** • Enhance vector control initiatives e.g. supply of the mosquito nets, unclogging of drainage, stagnated water and awareness creation • Promote human Insurance cover • Capacity build community on sanitation, nutrition and housing. • Put in place contingent measures for disease prevention and control. • Capacity Building on emerging and re-emerging vectors • Strengthen surveillance systems on vectors and diseases • Enforce the malaria control act • Vaccination against diseases e.g. Malaria, Cholera, • Treatment of emerging and re-emerging diseases
Landslides			
Water	**Agriculture**	**Environment**	**Others (Disaster management, health, energy and infrastructure services)**

• Protection of the water catchment areas	• Conservation agriculture e.g. gabions, cut off drainage, terraces, contour ploughing • Promote Agroforestry (agrosilvopastoral). • Capacity building on riparian agricultural laws and policies	• Promote Agroforestry (silvo-agriculture e.g.). • Reforestation & afforestation • Promote riparian forestry buffers. • Promotion of community tree nurseries • Capacity building on SLM practices • Rehabilitation of the degraded landscapes.	**Disaster Management** • Early warning systems; • Timely dissemination of climate information; • Community awareness Creation on disaster response during landslides; • Mapping of landslides hotspots
Hailstorms			
Water	**Agriculture**	**Environment**	**Others (Disaster management, health and infrastructure services)**
• Climate proofing of existing and new water infrastructures	• Climate smart agroforestry practices such as agrosilvopastoral through alley cropping and hedgerows. • Growing of short season crops; • Multistory cropping	• Promote climate smart agroforestry (boundary tree growing- windbreakers/hedgerows and silvo-agriculture). • Promote forest farming (Multistory cropping.	**Disaster Management** • Early warning systems; • Timely dissemination of climate information; • Community awareness Creation on disaster response;

CHAPTER 6: CONCLUSION

The increasing incidence of climate hazards calls for greater institutional capacity to respond to changes. Climate change is a global problem that affects both the present and future generation as it alters the natural environment in many aspects including prolonged dry spells, intensive rainfall, high pests and disease prevalence, landslides and floods among many other hazards that occur during different times of the year.

The hazards greatly affect the livelihood of the communities with direct impacts being water scarcity, low crop productivity, fire outbreaks, destruction of infrastructure and destruction of crops and indirect impacts being loss of lives (deaths), low income, low tree coverage, habitat displacement and food insecurity.

The PCRA objective is to ensure that the county governments through local communities have identified climate risks caused by climate change and propose mitigation and adaptation measures to address climate change effects and make communities more resilient to climate change related shocks.

Adequate budget provision to carry out climate risk management activities could be accompanied by relevant policies and interventions anchored in development plans. This combination of careful budgeting, policy, and planning will provide enabling frameworks to allow various stakeholders in climate risk management to work together on strategies that help the county cope with climate change and variability through the FLLoCA program and the County Annual Development Plans in partnership with other county departments, national government entities, development partners and local community among other stakeholders.

The PCRA process was completed successful and used to inform the development of the CCCAP. However, it should be noted that most of the institutions formed at steer implementation of climate change responses are at nascent stage after their formation a couple of months before the PCRA was conducted. This is particularly true for the most of the Ward Climate Change Planning Committees (WCCPC). Consequently continuous institutional capacity strengthening and accompaniment will be required to enable the institutions to deliver on their mandate. The capacity development should be structured to support and equip county

actors and their partners to operationalise implementation of the CCCAP and integration of climate change into the County Annual Development Plans and CIDP

Several challenges were encountered that affected implementation of the PCRA. These included inadequate or lack of funds for the PCRA process and inflexible timelines set. Despite the institutional capacity strengthening grant from FLLoCA being released by Treasury to the counties, it took inordinately long to get the funds to the counties from the County's Central Bank of Kenya special purpose account which resulted to delays and lost time.

ANNEXES

Annex I: County fact sheet

Information Category		County Statistics (as at 2022)	National Statistics (as at 2022)
County Area:			
Total area (Km2)		2495.6Km2	582,646 Km2
Non-arable land (Km²)		514.6 Km2	
Tree cover		37831.22ha (15.16%)	7180000ha (12.13%)
Arable land (Km²)		1980 KM2	5,800,000 Ha (10.19%)
Size of Gazetted forests (Ha)		45600ha	1,001,000(indigenous)
Size of non-Gazetted forests (Ha)		252.53ha	2,600,000ha
Approximate forest cover (%)		32,854.77ha (13.6%)	5,226,191.79ha (8.83%)
Tree cover per capita(msq/person)		382.0	1,507.58
Forest cover per capita(msq/person)		331.75	1,097.26
Water mass (Km2)		0	11,230km2
No. of rivers, lakes and wetlands protected		2435	
Total urban areas (Km2)		543	
Number of urban areas		300	
Number of planned urban areas		25	
Number of surveyed urban area		16	
% titled land		60	
No. of quarry sites rehabilitated		3	
No. of climate change adaptation projects/programmes		8	
Ecological condition		3	
TOPOGRAPHY AND CLIMATE			
Lowest altitude(meters)		1660	0
Highest (Metres)		4299	5,197
Temperature range:	High	29.2	30.3
	Low	11.2	18.3
Rainfall	High(mm)	1700	2,000
	Low(mm)	900	250
Average relative humidity (%)		67	58%.
Wind speed (Kilometres per hour/knots)		66.79Km/h or 36.06Knots	15 kph (9 mph)
DEMOGRAPHIC PROFILES			
Total population		1,049,448	47,564,296

Total Male population		522,244	23,548,056
Total Female population		527,203	24,014,716
Total intersex Population		28	1,524
Sex ratio (Male: Female)		1:1	1:1
Projected Population	Mid of plan period (2025)	1,108,221	59,032,161
	End of plan period (2027)	1,144,374	63,439,227
Infant population (<1year)	Female	13,096	615,543
	Male	13,315	615,520
	Inter-sex	-	42
	Total	26,411	1,231,105
Population under five	Female	71,558	3,327,403
	Male	72,776	3,349,211
	Inter-sex	-	172
	Total	144,334	6,676,786
Pre- Primary School population (3-5) years	Female	45,858	2,072,212
	Male	47,040	2,100,127
	Inter-sex	-	105
	Total	92,898	4,172,444
Primary school age group (6-13) years	Female	130,522	5,595,068
	Male	131,131	5,667,365
	Inter-sex	-	297
	Total	261,653	11,262,730
Secondary school age group (14 -17) years	Female	101,065	2,498,828
	Male	104,443	2,607,294
	Inter-sex		146
	Total	205,508	5,106,268
School Going Population as per CBC Curriculum			
Pre-Primary School population (3- 5) years	Female	45,858	2,072,212
	Male	47,040	2,100,127
	Inter-sex	-	105
	Total	92,897	4,172,444
Primary school age group (6-12) Years	Female	113481	4,894,744
	Male	114065	4,959,775

	Inter-sex	-	265
	Total	227546	9,854,784
Junior Secondary School age group (13 -15) years	Female	48779	2,006,927
	Male	49512	2,072,016
	Inter-sex	-	114
	Total	98290	4,079,057
Senior Secondary School age group (16 -18) years	Female	40020	1,701,380
	Male	41998	1,772,786
	Inter-sex	-	91
	Total	82,018	3,474,258
Youthful population (15-29) years	Female	157,627	7,741,606
	Male	151,634	7,395,603
	Inter-sex	-	568
	Total	309,261	15,137,777
Women of reproductive age (15 - 49) years		265,434	13,474,050
Labour force (15-64) years	Female	315,531	15,331,438
	Male	312,936	14,915,142
	Inter-sex	-	1,080
	Total	628,465	30,247,660
Aged population (65+)	Female	20,541	1,163,144
	Male	17,649	920,619
	Inter-sex	-	58
	Total	38,290	2,379,857
Population aged below 15years		469937	21,988,320
Eligible Voting Population As at 1st April 2022	Name of Constituency		
	1.Kwanza	75,839	
	2. Endebess	50,688	
	3. Cherangany	91,830	

	4. Saboti	87,384	
	5; Kiminini	93,240	
	Total County	398,981	
No. of Urban (Market) Centres with population>2,000			
Urban population (By Urban Centre)			
Kitale	Female	90,960	
	Male	89,704	
	Intersex	-	
	Total	180,664	
Kiminini	Female	9,559	
	Male	8,890	
	Intersex	-	
	Total	18,449	
Rural population	Female	457,849	
	Male	446,294	
	Total	904,143	
Population Density (persons per km2) by Sub-county	Saboti Cherangany Kwanza Endebess Kiminini	634 406 488 184 737	
Incidence of landlessness (%)			
Percentage of farmers with title deeds (%)			
Mean holding size (in Acres)		2.7	
Labour force by sector (No.)	Agriculture: Male	55,090	1748000
	Female	56,656	1624000
	Intersex	-	-
	Rural self-employment: Male	64,966	6,625,973
	Female	66,812	7,247,112
	Intersex	-	339
	Urban self-employment: Male	22,323	
	Female	14,882	
	Intersex		
	Wage employment: Male	40,492	

	Female	39,373	
	Intersex		
Unemployment levels (%)	Male	3.9	5.4
	Female	3.5	5.1
	Intersex	-	0
	Total	7.4	10.5
Total number of households		55,763	12,143,913
Average household size		4.9	3.9
Female headed households (%)		5	
Child headed households (%)		3	
Children with special needs	Male		106,093
	Female		88,802
	Intersex		-
	Total		194,895
Children in labour (No)	Male		
	Female		
	Intersex	-	
	Total	19 (Cases)	436 (Cases)
Number of PWDs	Visual	6009	333520
	Hearing	2727	153,361
	Speech	1399	111,355
	Physical	2272	385,416
	Mental	3549	212,797
	Albinism	211	-
	Other	0	0
	Total	15,956	1,196,449
Orphans and Vulnerable children (OVCs) (No.)		6641	379,000 (Households)
Number of street Families		273	43,009
Orphanages (No.)		29	101
Rescue centres (No.)		7	
Gender Protection Units (No.)		1	
Correction/rehabilitation facilities (No.)		1	67
Social protection-cash Transfer to older persons (70+) beneficiaries		12,000	523,000
POVERTY INDICATORS (Source: KIBHS 2015/16)			

Absolute poverty (%)		34.1	36.1
Rural poor (%)			40.1
Hard core (Extreme poverty)		9.7	8.6
Food poverty (%)		33.3	32
Contribution to National Poverty (%)		2.2	
HEALTH			
Five most common diseases (in order of prevalence) under 5 years		Upper Respiratory Tract Infections	Upper Respiratory Tract Infections
		Malaria	Diarrhea with some dehydration
		Diseases of the skin	Disease of the skin
		Lower Respiratory Tract Infections	Malaria
		Pneumonia	Lower Respiratory Tract Infections
Five most common diseases (in order of prevalence) over 5 years		Upper Respiratory Tract Infections	Upper Respiratory Tract Infections
		Malaria	Malaria
		Pneumonia	Disease of the skin
		Other Lower Respiratory tract infections	Lower Respiratory Tract Infections
		Urinary Tract Infections	Arthritis, Joint pains etc.
Infant Mortality Rate (IMR)/1000		34 (KDHS 2014)	39 (KDHS 2014) 32.6 GBDS 2017
Neo-Natal Mortality Rate (NNMR)/1000		(Regional data not provided in KDHS)	21 (KDHS, 2022)
Maternal Mortality Rate (MMR/100,000)		69/100,000(KHIS July 2021-July 2022)	362 KDHS 2014, 257.6 (GBDS 2017)
Post Neo-Natal Mortality Rate (PNNMR)/1000		(Regional data not provided in KDHS)	11 (KDHS 2022)
Child Mortality Rate (CMR)/1000		(Regional data not provided in KDHS)	9 (KDHS 2022)
Under Five Mortality Rate(U5MR)/1000		51.1 (KPHC, 2019)	52 (KPHC, 2019)
Prevalence of stunting (Height for Age)		21% (KDHS,2022)	18% (KDHS, 2022)
Prevalence of wasting (Weight for Height)		(Regional data not provided in KDHS)	5% (KDHS, 2022)
Prevalence of underweight (Weight for Age)		5.5% (KHIS July 2021-June 2022)	11.2% (KDHS 2014
Life expectancy	Male		63(GHO)
	Female		68(GHO)
HIV prevalence (%)		3.5 (NASCOP Estimates)	4.3 (NASCOP)
Patients on ARVs (No.)		18,130 (KHIS, June 2022)	1,294,567 (KHIS, June 2022)
Average Distance to Health facility(km)		1 km (urban) 5 kms (Rural)	
Antenatal Care (ANC) (%) Is t ANC		1st ANC 86.3.	1st ANC 91.7%

		4th ANC- 43.2 (KHIS July 2021-June 2022	4th ANC 52.8% (KHIS July 2021-June 2022)
Health Facility Deliveries (%)		67.7 (KHIS July 2021-June 2022)	79.5 (KHIS July 2021-June 2022)
Registered traditional herbalist sand medicine-men (No.)			
Contraceptive use by women of reproductive age (15-49 yrs.) (%)		44.5 (KHIS July 2021-June 2022)	36.8 (KHIS July 2021-June 2022)
Immunization coverage (%)		80 (KHIS July 2021-June 2022)	82.9 (KHIS July 2021-June 2022)
CHVs (No.)		1,950	
Crude Birth-rate		(Regional data not provided in KDHS)	27.7 per 1000 live births
Crude death rate		8.9 per 1000 live births (KPHC,2019)	10.5 per 1000 live births (KDHS, 2019)
Health Facilities (No.)			
Hospitals	By Sub-county		
	Kiminini	6	
	Saboti	4	
	Endebess	2	
	Cherangany	2	
	Kwanza	1	
	Total	15	
Health Centres	Kiminini	6	
	Saboti	4	
	Endebess	1	
	Cherangany	7	
	Kwanza	4	
	Total	22	
Dispensaries	Kiminini	24	
	Saboti	31	
	Endebess	14	
	Cherangany	27	
	Kwanza	28	
	Total	124	
Private Clinics	Kiminini	10	
	Saboti	16	
	Endebess	2	
	Cherangany	11	
	Kwanza	12	

	Total	51	
Nursing Homes	Kiminini	1	
	Saboti	1	
	Endebess	0	
	Cherangany	0	
	Kwanza	0	
	Total	2	
Maternity Bed capacity	Kiminini	73	
	Saboti	36	
	Endebess	35	
	Cherangany	17	
	Kwanza	8	
	Total	169	
Youth friendly centres	Kiminini	3	
	Saboti	0	
	Endebess	0	
	Cherangany	0	
	Kwanza	0	
	Total	3	
Health Facility Bed Capacity	Kiminini	330	
	Saboti	178	
	Endebess	74	
	Cherangany	64	
	Kwanza	27	
	Total	673	
ICU Beds	Kiminini	5	
	Saboti	3	
	Endebess	0	
	Cherangany	0	
	Kwanza	0	
	Total	8	
	Kiminini	5	
	Saboti	5	
	Endebess	2	
	Cherangany	3	
	Kwanza	2	
	Total	17	

Doctor/patient ratio	Trans-Nzoia	1/11,363	
	Kiminini	1/7,407	
	Saboti	1/43,478	
	Endebess	1/29,412	
	Cherangany	1/35,714	
	Kwanza	1/10,753	
Nurse/patient ratio	Trans-Nzoia	1/1739	
	Kiminini	1/906	
	Saboti	1/1,904	
	Endebess	1/2,433	
	Cherangany	1/2,533	
	Kwanza	1/3,597	
Clinical Officers	Trans-Nzoia	1/7,194	
	Kiminini	1/4,629	
	Saboti	1/4,149	
	Endebess	1/9,901	
	Cherangany	1/12,500	
	Kwanza	1/23,810	
Laboratory Technicians	Trans-Nzoia	1/7,463	
	Kiminini	1/4,386	
	Saboti	1/5,376	
	Endebess	1/10,870	
	Cherangany	1/12,195	
	Kwanza	1/20,000	
AGRICULTURE, LIVESTOCK & FISHERIES			
Crop Farming			
Average farm size (Small-scale) (acres)		2.0	
Average farm size (Largescale)(acres)		55	
Main Crops Produced			
Food crops (list)			
Maize		105,110	1,484,843
Beans		52,418	2,135,714
Irish Potatoes		1,410	214,600
Sorghum		298	77,377
Finger Millet		533	125,429
Wheat		760	134,070
Sweet Potatoes		180	21,654

Tomatoes		785	29,629
Cabbages		624	31,420
Kales		924	37,837
Cassava		25	61,201
Cash crops(list)			
Maize		105,110	1,484,843
Tomatoes		785	29,629
Cabbages		624	37,837
Kales		924	37,837
Bananas		668	67,738
Avocado		640	25,677
Macadamia		214	6,029
Cut flowers		120	615
Tea		669	157,720
Coffee		2,700	119,617
Sugarcane		8,606	200,500
Total acreage under food crops (acres)		394,217	
Total acreage under cash crops (acres)		304,735	
Main storage facilities (Maize cribs, store and warehouses)		42,249	
Extension officer farmer ratio		1:2,333	
Livestock Farming			
Number of livestock	Dairy Cattle	209,628	5,017,991
	Beef Cattle	8,470	16,182,356
	Goats	43,770	33681559
	Sheep	155,974	24,801,605
	Camel	-	4,427,881
	Donkey	6,490	1,393,628
	Poultry	1,175,755	58,736035
	Others	40,270	
Number of Ranches		0	
Extension officer famer ratio		1:11000	
Irrigation Infrastructure			
Irrigation schemes	Small(<5Acres)	0	
	Large (>5Acres)	0	
Type of Livestock, Population and Value			
Dairy cattle	Quantity (Total Population)	209,628	15,017,991

	Value (Kshs.)	14,673,960,000	
Beef cattle	Quantity (Total Population)	8,470	16,182356
	Value (Kshs.)	338,8000,000	
Goat	Quantity (Total Population)	43,770	33,681,559
	Value (Kshs.)	218,850,000	
Sheep	Quantity (Total Population)	155,974,24,801,605	
	Value (Kshs.)	623,896,000	
Camel	Quantity (Total Population)	0	
	Value (Kshs.)	0	
Livestock Products and their Value (Annual)			
Milk	Quantity (kg.)	184,633,044	4,640,864,389
	Value (Kshs.)	7,385,321,760	236,744.350,282
Beef	Quantity (Kgs)	1,446,720	250,606,504
	Value (Kshs.)	651,024,000	115,145,083,586
Mutton	Quantity (Kgs)	332,720	50,842,168
	Value (Kshs.)	166,360,000	26,309,931,758
Chicken meat	Quantity (Kgs)	22,338	89,450,125
	Value (Kshs.)	16,753,500	44,644,211,606
Honey	Quantity (Kg.)	166,210	17,265,068
	Value (Kshs.)	83,105,000	13,528,939,434
Hides	Quantity (kg.)	87,311	4,595,522
	Value (Kshs.)	3,651,287	624,699,020
Eggs	Quantity (Trays)	795,344	240,854,186
	Value (Kshs.)	238,603,200	91,081,430,603
FISHERIES			
Fish traders (No.)		264	
Fish farm families (No.)		1781	
Fish ponds (No.)		2161	
Fish Tanks (No.)		0	
Area of fishponds (m2)		639,829	
Main species of fish catch (list with tonnage)		Tilapia	
		Catfish	
		Trout	

Fishing nets (No.)		9	
No. of fish landing sites		0	
No. of Beach Management Units		0	
OIL AND MINERAL RESOURCES			
Mineral and Oil potential			
Ongoing mining and extraction activities (Quarry, sand harvesting, cement etc.)			Quarry, Sand harvesting
FORESTRY			
No. of gazette forests		6	
No. of non-gazetted forests		5	
No. of community forests		1	
Main forest products (Timber, fuel and poles)			Timber, poles, wood fuel, logs, fruits, medicinal herbs, resins, local craft
Forestry products' value chain development			Eco tourism, Craft for furniture and hand tools, briquettes, seedlings production, honey, silk worms and bamboo products
Incidences of environmental threats (Loss of biodiversity, drought, floods, Forest fires, Deforestation)			Forest fires, floods, Loss of biodiversity due to poaching, drought, deforestation, pests and diseases. Landslides/mud slides, invasive species, overgrazing, encroachment, squatter's invasion. Over abstraction of water, soil erosion, pollution.
No. of people engaged in forestry		130,000	
No. of people benefiting from forest indirectly		1,000,000	
Seedling production	Forest Nurseries (No. of seedlings)	7,000,000 (CGTN-4,500,000; KFS-2,500,000)	
	Private Nurseries (No. of seedlings)	3,000,000(45 Tree nurseries)	
No. of community forest association established		8	
Quantity of timber produced(m^3)		120,000,000 (for 5 yrs.)	
Park and recreation sites	Government	1 (Kitale museum)	
	Private	2 (Lunar park & Kitale Club)	
Arboretum	Government	0	
	Private	1(Kitale Nature conservancy)	
EDUCATION AND TRAINING			
Pre-Primary School			
No. of ECDE centres		434	
No. of ECDE teachers		761	
Teacher/pupil ratio		1:58	

Total Enrolment	Girls	22607	
	Boys	14312	
Average years of attendance(years)		2	
Total		44327	
Private ECDE			
NO. of ECDE centers		462	
No. of ECDE teachers		764	
Teacher/pupil Ratio		1:37	
Total enrolment	Girls	13690	
	Boys	14312	
	Total	28002	
Primary Schools			
Number of primary schools		384	
Number of teachers		4742	
Teacher/pupil ratio		1:50	
Total enrolment	Boys	120510	
	Girls	117152	
	Total	237662	
Private primary schools			
No. of primary schools		218	
No. of teachers		2596	
Teacher/pupil ratio		1:16	
Total enrolment	Boys	19650	
	Girls	19728	
	Total	39378	
Dropout rate %			
Enrolment rate %			
Retention rate %			
Proportion of community nearest to public primary school	0 – 1Km		
	1.1– 4.9Km		
	5Km and more		
Special Needs Schools			
Number of Special Needs Schools		16	
No. of Integrated Schools		5	
Number of teachers		549	
Teacher/pupil ratio		1:38	
Total enrolment	Boys	330	

	Girls	300	
Dropout rate %		8	
Enrolment rate %		94	
Retention rate %		86	
Public Secondary Schools			
Number of secondary schools		241	
Number of teachers		2924	
Teacher/student ratio		1:37	
Total enrolment	Boys	53230	
	Girls	53745	
	Total	106975	
Dropout rate %		5	
Enrolment rate %		94	
Retention rate %		83	
Proportion of community nearest to public secondary school	0 – 1Km	20	
	1.1– 4.9Km	43	
	5Kmand more	53	
Vocational Training Centres	No.	32	
	Enrolment	3200	506109
	Attendance	3200	506109
	No of VTC instructors	156	
	Instructor to Leaner ratio	1:21	
Tertiary Education (accredited public and private)	No. of TVETS	31	
	No. of universities	2	
	Enrolment (desegregate by sex)	Male-7201 Female-5592	Male-268,755 Female-202,204
	Attendance	12793	470,983
Adult Literacy	Number of adult literacy Centres	38	
	Enrolment	1764	18,750
	Attendance	1058	18,750
Literacy rate (%)	Male	81	84.6
	Female	77	81.2
	Total	79	82.9
Ability to read	Can read (%)	81	
	Cannot read (%)	19	

Ability to write	Can write (%)	57	
	Cannot write (%)	32	
Ability to read and write	Can read and write (%)	45	
	Cannot read and write (%)	21	
Percentage of schools with access to:	Electricity	0.26% (primary sub-sector)	
	Internet	60%	
	Computers	80% (laptop for primary school and at least one computer per secondary school)	
TOURISM AND WILDLIFE			
Hotels by category (No.)	Five stars	0	40
	Four-star	0	67
	Three stars	0	122
	Two stars	0	145
	One star	0	274
	Unclassified	84	7332
Hotel bed capacity by category (No.)	Five stars	0	1600
	Four-star	0	2031
	Three stars	0	2350
	Two stars	0	2056
	One star	0	1963
	Unclassified	2099	12500
Animal Types((No.)	Elephants	325	36,280
	Buffalos	469	4499
	Lion	2	2489
	Leopards	10	
	Zebra	82	3000
	Sitatunga	65	475
	Water bucks	108	543
	Bush bucks	54	1289
	Monkeys colobus	40	120
	Dayaks	30	249
Number of Wildlife Conservation Areas (No.)	Game parks	2	24
	Reserves	0	15
	Conservancies	1	20
	Game ranches	0	37
Number of tourists visiting attraction sites,	Domestic	42, 000	2,500,000

annually (No.)	Foreign	8,000	670,000
Museums(list)			
Heritage and Cultural sites (No.)			
Social Amenities			
Talent Academies (No.)		2	
Community sports grounds		4	
Sports stadia (No.)		1	
Libraries/information documentation centres (No.)		1	
Social halls/Recreation Centres (No)		1	
Public Parks (No)		1	
Active county sport federation		13	
Sports team in the Kenya Premier league		1	
Sports team in the national super league		1	
Sports in Div1		1	
FINANCIAL SERVICES			
Number of co-operative societies		345	25,050
Active cooperative societies (No.)		269	5262
Dormant cooperatives societies (No.)		100	19788
Collapsed Cooperatives (No.)		24	-
Total Registered Membership (No.)		3456	14,000,000
Commercial banks (No.)		18	46
Micro-finance Institutions (No.)		40	
Mobile money agents (No.)		924	
Village Savings and Loan Associations (No.)		0	
COMMUNITY ORGANIZATIONS/NON-STATE ACTORS			
Public Benefits Organizations (PBOs)	NGOs	34	4,194
	CBOs	255	
	FBOs	345	
	FBOs		
	Special interest groups		
	Self Help Groups	4,195	
	Women Groups	2,425	
	Youth Groups	1,428	
BLUE ECONOMY			
Total Area under marine protection		0	
Total area of marine reserves		0	
Private water sports e.g. swimming pools		10	

Government water sports		0	
ENVIRONMENTAL MANAGEMENT			
Volume of solid waste generated: Daily/Annual		Daily 204 tonnes	
Volume of solid waste collected & Disposed: Daily/Annual		80 tonnes	
Proportion of waste recycled		10% (private)	
No. of Material Recovery Facilities		0	
No. of Waste Management Facilities		4	
WATER AND SANITATION			
Households with access to piped water (No.)		51640	
Households with access to portable water (No.)		88865	
Permanent rivers (No.)		4	
Shallow wells (No.)		25	
Protected springs (No.)		544	
Un-protected springs (No.)		25	
Water pans (No.)		30	
Dams (No.)		65	
Boreholes (No.)		38	
Distribution of Households by Main Source of water (%)	Piped into dwelling	5.3%	10.1
	Piped	7.4%	14.1
	Rain/harvested	0.8%	3.9
	Borehole	16.3%	9.9
	Protected well	22.7%	7
	Protected spring	15.5%	7.1
	Unprotected well	2.9%	2.6
	Unprotected spring	2.5%	2.4
	Stream	15%	16.8
	Water Vendor	2.7%	8.5
	Dam	0.3%	3.3
	Pond	1%	1.6
	Lake	0	
Water supply schemes (No.)			
Average distance to nearest water point(km)		1.2	
Households distribution by time taken (minutes, one way) to fetch drinking water:	0	0	
	1-4	32	
	5-14	3	
	15-29	5	
	30-59	12	

	60+	4	
No. of Water Resource User Associations (WRUA) Established		14	
Households with latrines	Flush toilet	1.4	
	VIP Latrine	13.4	
	Uncovered Pit Latrine	13.8	
	Bucket	0.4	
	None	0	
Community distribution by type of waste/garbage disposal(percent):	Collected by local Authority	14	
	Collected by Private firm	2	
	Garbage pit	5	
	Burning	43	
	Public garbage heap	4	
	Farm Garden	35	
	Neighbor hood Community group	2	
ENERGY			
Households with electricity connection (prop.)		27%	
% of trading centres connected with electricity		30.7	
HHs distribution by main cooking fuel	Electricity	0.4%	0.9%
	Gas (LPG)	6.4%	23.9%
	Biogas	0.5%	0.5%
	Solar	0.4%	0.2%
	Paraffin	4.9%	7.8%
	Firewood	65.8%	55.1%
	Charcoal	17.7%	11.6%
HHs distribution by main lighting fuel	Electricity	30.7%	50.4%
	Gas (LPG)	3%	0.2%
	Biogas	11.1%	0
	Solar	5%	19.3%
	Paraffin	19.3%	6.6%
	Tin lamp	29.1%	9.6%
	Fuel wood	38.9%	2.9%
HOUSING			
Type of Housing	Permanent (%)	24	
	Semi-permanent (%)	43	

Roofing material	Iron Sheets (%)	94	80.3
	Grass thatched (%)	2.3	5.1
	Tiles (%)	0.6	1
Housing wall	Bricks (%)	0.6	10.2
	Mason stones (%)	1.0	16.5
	Mud (%)	0.9	27.5
Floor type	Cement (%)	0.6	43.7
	Earthen (%)	1.0	30
	Clay (%)	1.0	13
INFRASTRUCTURE			
Road Length		4060	160886
Bitumen surface(km)		282.4	
Gravel surface(km)		201.2	
Earth surface (km)		2164	
Railway line(km)		23	
Railway stations (No.)		1	
Major bus parks (No.)		1	
Lorry parks (No.)		0	
Operational Airports (No.)		0	8
Operational Airstrips (No.)		1	9
Floodlights/streetlights (No.)			
Telecommunication		12	
Number of telephone connections % of county covered by CDMA wireless		25	
Mobile network coverage (%)		40.4	47.3
Proportion of population with internet/broadband Connectivity		16.9	22.6
Private couriers (No.)		12	
Post Offices (No.)		3	
Licensed stamp vendors (No.)		0	
TRADE AND INDUSTRY			
Trading centres(with>2000population) (No.)		3	
Registered retail traders (No.)		13581	
Registered wholesale traders (No.)		3892	
Jua kali Associations (No.)		362	

Major industries (No.)	67	
Micro, Small and Medium Enterprise (No.) (MSME survey basic report of 2016)	168,000	
No of Market Stalls	4750	
FIRE AND DISASTER MANAGEMENT		
Fire engines (No)	4	
Fire stations (No)	1	
Firefighters (No)	28	
Ambulance (No)	0	
Fire hydrants	180	

Annex II: County Background Information

County Administrative Units

Name of Sub County	Area in Km2	No of Wards	No of Divisions	No of locations	No Sub locations
Kiminini	395.3	6	2	10	21
Saboti	323.6	5	3	9	12
Cherangany	629.8	7	2	12	25
Endebess	680.0	3	2	8	14
Kwanza	466.9	4	2	8	20
Total	**2495.6**	**25**	**11**	**47**	**92**

Source: KNBS 2022

Population Projections (by Sub-County and Sex)

Sub-County	Census (2019)				Projection (2022)				Projection (2025)				Projection (2027)			
	M	F	Inter - sex	T	M	F	Inter-sex	T	M	F	Inter -sex	T	M	F	Inter -sex	T
Saboti	101,198	101,174	5	202,377	112739	2713	6	225458	125597	125567	6	251171	134974	134942	7	269922
Cherangany	113,498	116,029	11	229,538	126442	9262	12	255716	140863	144004	14	284880	151379	154755	15	306148
Kwanza	100,234	103,584	3	203,821	111665	5398	3	227066	124401	128558	4	252963	133688	138156	4	271848
Endebess	56,090	55,689	3	111,782	62487	2040	3	124530	69613	69116	4	138733	74810	74276	4	149090
Kiminini	118,087	124,730	6	242,823	131555	8955	7	270516	146558	154803	7	301368	157499	166360	8	323867

Population distribution and density by Sub-County

Sub- County	2019 (Census)			2022 (Projection)		2025 (Projection)		2027 (Projection	
	Area (KM2)	Population	Density	Population	Density	Population	Density	Population	Density
Saboti	355.4	202,377	569	225,458	634	251,171	707	269,922	759
Cherangany	629.1	229,538	365	255,716	406	284,880	453	306,148	487
Kwanza	465.3	203,821	438	227,066	488	252,963	544	271,848	584
Endebess	678.4	111,782	165	124,530	184	138,733	205	149,090	220
Kiminini	366.9	242,823	662	270,516	737	301,368	821	323,867	883

1.4.1.1.Source: KNBS 2022

Population by Broad age groups

Age Group	2019 (Census)			2022 (Projections)			2025 (Projections)		
	F	T	M	F	T	M	F	T	M
Infant Population (<1 Year)	11,952	11,755	23,707	13,315	13,096	26,411	14,834	14,589	29,423
Under 5 Population	65,326	64,232	129,558	72,776	71,558	144,334	81,076	79,718	160,795
Pre-School (3- 5 Years)	42,224	41,163	83,387	47,040	45,858	92,897	52,404	51,087	103,492
Primary School (6 –13 Years)	117,707	117,160	234,867	131,131	130,522	261,653	146,086	145408	291494
Secondary School (13 – 19 Years)	93,751	90,719	184,470	104,443	101,065	205,508	116,355	112,592	228,946

Youth (15 –29 Years)	136,111	141,490	277,601	151,634	157,627	309,261	168,928	175,604	344,531
Women of Reproductive Age (15 – 49 Years)	-	238,261	238,261	-	265,434	265,434	-	295,706	295,706
Economically Active Population (15 – 64 Years)	261,148	272,967	534,115	312,936	315,531	628,465	341,378	341,910	683,287
Aged (65+)	15,842	18,528	34,370	17,649	20,641	38,290	19,662	22,995	42,657
Infant Population (<1 Year)	11,952	11,755	23,707	13,315	13,096	26,411	14,834	14,589	29,423
Under 5 Population	65,326	64,232	129,558	72,776	71,558	144,334	81,076	79,718	160,795

Annex III: Natural Resource Assessment

Trans Nzoia County is endowed with variety of natural resources. The table below provides details of the Natural resources found within the county.

Natural Resource Assessment

Natural Resource	Dependent Sectors	Status, Level of Utilization; Scenarios for Future	Opportunities for optimal utilization	Constraints to optimal utilization	Existing Sustainable Management strategies
River Koitobos(Sabwani,) Noigasmaget (Kapolet), Losourwa, Kaptega, Suam, Rongai (Kiminini, Ewaso Rongai) , and Kaptega	Water, Environment and Natural Resources; Agriculture, Livestock and Fisheries; Public Works, Transport and Energy	Declining flows due to over abstraction of water and encroachment of riparian land. This is expected to further to decline with embracing of water fed agriculture sector and climate change effects. Degradation of river banks due to human activities including unregulated sand harvesting Water quality expected to decline due to non-climate smart farming activities Enhancing micro climate leading to increased amount of rainfall	Can support farming activities (Irrigation, Aquaculture, Apiculture and livestock production). Blue economy such as water sporting'; Development of mini hydro power for clean and green energy generation.	Increased damming upstream; Application of Agrochemicals Deforestation along the river banks Unfavorable tree species within riparian land Duplication of roles between the County and National government functions	Legal and policy enforcement at county and National levels River rehabilitation programs WRUA in place Sensitization of the community on SLM practices

Natural Resource	Dependent Sectors	Status, Level of Utilization; Scenarios for Future	Opportunities for optimal utilization	Constraints to optimal utilization	Existing Sustainable Management strategies
Wetlands (Saiwa, Namanjalala,Sinyereri/ Kipsaina, Kapolet, Chepkaitit,Chepchoina, Mubere, Kiptogot Machinjoni, Lokichar, Kitale Nature, Bidii/Pombo, Wamuini/Namwichula and Saiwa Parks	Water, Environment and Natural Resources; Agriculture, Livestock and Fisheries; Trade, Commerce, cooperative Development and Tourism; Wildlife, Forestry; Water, Environment and Natural Resources;	Declining in wetland surface area due to uncontrolled human activities leading to biodiversity loss. These is expected to be acerbated by climate change effects Planting of unfavorable species of trees. Water quality expected to be affected negatively due to non-climate smart farming activities Declining population of wildlife (small game) due to poaching Invasive plant species affecting both flora and fauna Increase in human – wildlife conflict due encroachment Declining bio diversity due to climate change effects	To Control and storing of flood water Aquaculture Eco tourism Can support increased farming activities downstream through Irrigation Fencing to minimize human-wildlife conflict and poaching Increased local and foreign tourists' attraction Potential for development of hospitality industry and recreation sites	Development of water harvesting infrastructure upstream Application of Agrochemicals upstream Deforestation within wetland and its environs Unfavorable tree species within wetland and its environ Poaching Climate change effects Invasive species Emerging issues like effects of COVID-19 Inadequate staffing levels	Legal and policy enforcement at county and National levels Wetland rehabilitation programs WRUA in place Sensitization of the community on Wetland Management practices Enhanced patrols Mechanical elimination of invasive species Community sensitization on effects and consequences of poaching Marketing of the parks
Mt. Elgon	Tourism Agriculture Water and environment	Over Tourism especially in the caves Mt. Climbing activities Loss of the forest cover	Sustainable tourism practices; Best practices in waste water management and Wetland	Community land practices; Water quality deteriorated from horticulture (Affecting quality	Working with Community Forest Associations(CFAs); Waste management

Natural Resource	Dependent Sectors	Status, Level of Utilization; Scenarios for Future	Opportunities for optimal utilization	Constraints to optimal utilization	Existing Sustainable Management strategies
			conservation in some farms; Ecotourism Cross Boarder Tourism	of fish, and quality of tourism)	
Cherangany Hills	Tourism; Agriculture Water and Environment	Agro Tourism Sport fishing Tourism	Can support sport fishing(trout fish)	Overfishing Pollution	Legal and policy enforcement Forest rehabilitation program
Elgon, Sikhendu, Township and Kapolet Forests	Trade, Commerce, cooperative Development and Tourism; Wildlife, Forestry; Water, Environment and Natural Resources;	Declining forest cover due to growing population of the forest dependent communities, urbanization, illegal logging, forest fires, invasive species and increased effects of climate change Forest excision and encroachment	Enhance micro climate leading to increased amount of rainfall Increased apiculture Harvesting of tree seedlings for afforestation Sources of herbal medicine of Eco-tourism Growing interest in Conservation by stakeholders, development partners and donor e.g. EU, GEF etc.	Decreased forest cover due to pests and diseases as a consequence of climate change effects Illegal logging and poaching Inadequate funding to support conservation and protection measures Insufficient staff establishment.	Legal and policy enforcement Adopt climate change adaptation and mitigation actions Sensitization of the community on forest conservation Participatory forest management approach Increase promotion of bamboo for conservation and product utilization

Natural Resource	Dependent Sectors	Status, Level of Utilization; Scenarios for Future	Opportunities for optimal utilization	Constraints to optimal utilization	Existing Sustainable Management strategies
Wildlife (Fauna and Flora); Buffalos Sitatunga Zebras Water bucks Bush bucks Velvet Monkey Columbus Monkey Elephants	Tourism Water and Environment	Game tourism Adventure tourism	Sustainable tourism Environmental conservation	Human wildlife conflicts Environmental degradation Over tourism Pouching and game hunting	Community wildlife conservation committees(CWCC) (Wildlife conservation and Management Act)
Private forest (Kitale Club, Kitale Nature Conservancy, Poly noyce farm, Norman Pim)	Water, Environment and Natural Resources; Irrigation, Wildlife Forestry, Apiculture Eco-Tourism	Reducing forest cover due to change in land use Uncontrolled logging practices, forest fires, invasive species and increased effects of climate change	Increased apiculture Harvesting of tree seedlings for afforestation Sources of herbal medicine Promotion of Eco-tourism (Arboretum, parks and recreation sites) Growing interest in Conservation by stakeholders, development partners and donor such as GCF.	Decreased forest cover due to invasive species, pests and diseases as a consequence of climate change Un controlled logging Inadequate funding to support conservation activities Bureaucracy to access incentives to support on farm conservation Change in land use practices	Legal and policy enforcement at county level Carbon credit incentives Adoption of green and alternative source of energy Nature based enterprises Sensitization of the community on forest conservation
Sand in keiyo (Robinson/Kapkoi)	Construction	River bank degradation and	Alternative	Lack of policy and	Establishment of policy and legislation

Natural Resource	Dependent Sectors	Status, Level of Utilization; Scenarios for Future	Opportunities for optimal utilization	Constraints to optimal utilization	Existing Sustainable Management strategies
valleys and long R. Nzoia		weakening of infrastructure due to un controlled sand harvesting. Land degradation leading to hazard's	community livelihood Provision of locally available resources for construction Development of water storage structure e.g., sand dams	legal framework at county level Increasing demand for housing and infrastructure for development	at county level
Kayos, Saboti and Lukhome quarries	Public works	Increasing uncontrolled quarry activities due to high demand of construction materials leading to land degradation and potential for mud/landslides Increase in excavation filled with water forming breeding ground for vector borne diseases	Quarry sites can be used for sanitary land fill during decommission phase May be utilized as a water harvesting and storage facility for use in farming and recreational purposes on decommissioned quarry sites	Potential Source of water / vector borne diseases Land degradation Potential for drowning incidents Lack of policy and legal framework at county level Inadequate Mainstreaming of environmental safe guards (EIA) by County departments	Establishment of policy and legislation at county level Protection /fencing of quarry sites Backfilling of the decommissioned sites Mainstreaming of environmental safe guards (EIA)

Annex IV: WARD CLIMATE ACTION PLAN

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
KIMININI SUB-COUNTY					
KIMININI	prolonged dry spell	Reduced water supply Reduced pasture Crop failure	Conflict Low milk supply reduced yields	Entire Kiminini ward	Women Youth children PLWD Elderly
	Wind storms	Crop damage Disruption of rainfall patterns Damage of infrastructure	Hunger Delayed planting season Loss of life	Entire Ward	women youth children PLWD elderly
	Pests & diseases	Crop damage Livestock death Low farm produce	Low food supply Low production Conflict	Entire Ward	women youth children PLWD elderly
SIRENDE	Floods	Death	Trauma reduced human resource	Along River Sabwani	women Youth children PLWD elderly
		Displacement	loss of property soil erosion		
		Loss of crops	Hunger Reduced Income		
	Unreliable Rainfall	Delayed Planting Season	delayed maturity		
		Reduced crop	pest invasion (armyworm)		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
		&livestock yields	low income levels food insecurity reduced quality & quantity of animal produce		
		Reduced pasture availability	Reduced milk availability Conflict		
	Prolonged dry spell	Reduced water levels	waterborne diseases reduced availability of water for domestic use	Entire ward	Women Youth children PLWD elderly
		Scarcity of vegetables	low supply ,high prices pest invasion (armyworm)		
		Reduced animal yields	Malnutrition low milk supply, high prices		
WAITALUK	Floods	soil erosion	Loss of fertile top soil Loss of crop cover	Along River Namwichula	women Youth children PLWD elderly
		Displacement	Loss of livestock and crops		
		Water pollution	Waterborne diseases		
	Prolonged dry spell	Food shortage	Hunger	Entire ward	
		Crop failure	Conflict		
		Water scarcity	Long distance in alternative search		
	Erratic rainfall patterns	Low food production	Hunger	Entire ward	
		Disruption planting and harvesting season	Emergence of pests & diseases		
		Food scarcity	Conflicts between livestock &human		
SIKHENDU	Delayed planting season	Emergence of pests & diseases	High treatment cost	Entire ward	women Youth children
	Prolonged dry	Food shortage	High food prices		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
	spell				PLWD
	Floods	Soil erosion	Loss of crops		
		Land degradation	Distortion of land cover		elderly
NABISWA	Prolonged dry spell	water shortage food shortage	shortage of pasture Insecurity	Entire ward	women Youth
	Heavy rainfall	land degradation Floods environmental pollution soil erosion	Loss of crops Death of livestock Siltation		children PLWD elderly
	Erratic rainfall patterns	reduced yield increased cost of produ	Food shortage		
HOSPITAL	Prolonged dry spell	Livestock death Low farm produce Crop failure Reduced water supply	reduced crop production reduced income Malnutrition reduced crop production strain on income human animal conflicts death of livestock reduced livestock production human conflicts	The entire ward	
	Heavy Rainfall	Soil erosion Floods	siltation of water bodies leaching of soil minerals water borne diseases loss of livestock displacement of people	Along the river banks	

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			reduced farm production destruction infrastructure water borne diseases		
	diseases	Low production(manpower) Low production(livestock	low yields loss of livestock low income	Entire ward	The farmers Women Youth Elderly
SABOTI SUB-COUNTY					
MATISI	Heavy rainfall	storm water soil erosion damage of crops	water contamination leaching of nutrients poor production	Along the river banks	women Youth children PLWD elderly
	Prolonged dry spell	water shortage crop failure shortage of pasture scramble for water	Water wash diseases. Low food production (malnutrition). animal starvation and death Conflict.	The entire ward	
	Erratic rainfall patterns	delayed planting shortage of water crop failure	low/poor crop production poor sanitation low food production affects market activities low income	The entire ward	
MACHEWA	Prolonged dry spell	food shortage water shortage wildfires	malnutrition low income	The entire ward	women youth children
	Heavy rainfall	Impassable road	Loss of crops	Floods happen on the	

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
		soil erosion water pollution	Death of livestock	slopes Along the river banks	PLWD elderly
	Wind storms	destruction of property crop and tress destruction		The entire ward	
SABOTI	Erratic rainfall patterns	Erosion drying of water sources	soil infertility loss of crops Gullies reduction in water for use	The whole ward	women youth children PLWD IPs elderly
	Prolonged dry spell	reduced pasture for livestock low yields wild fires	malnutrition low income		
	Floods	increased water borne diseases crops submerged loss of infrastructure			
TUWAN	Prolonged dry spell	scarcity of water increased temperature	human conflict increased water related diseases heat stroke Dehydration	The whole ward	women youth children PLWD elderly
	Heavy rainfall	Floods Landslide	water borne diseases displacement human conflict	On the slopes	
	Wind storms	destruction of property	respiratory diseases high reconstruction cost		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
KINYORO	Floods	soil erosion destruction of property	siltation of dams waterborne diseases loss of life displacement of people affects transport & communication	Along Kisawai and Kaboywo River	women youth children PLWD elderly
	Unreliable rainfall	Delayed planting season	low yields Hunger Conflict		
	Wind storms	soil erosion destruction of property loss of life			
KWANZA SUB-COUNTY					
KAPOMBOI	Floods	low farm production soil erosion Flooding	Soil leaching	River Sabwani catchment area	women youth children PLWD elderly
	Prolonged dry spell	water scarcity increase in temperature low farm production	Conflict reduced pasture low income		
	Strong winds	destruction of property destruction of crops	high reconstruction cost Hunger		
KWANZA	Prolonged dry spell	Loss of pasture Reduced water availability Diseases and pests	reduced yields loss of lives high cost of production low levels of clean water poor sanitation retardation of crop deaths of animals and crops high cost of maintenance reduced yields		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			food insecurity		
	Erratic Rainfall	Poor Germination Loss of pasture Reduced surface Water Post-harvest losses	reduced yields high cost of production food insecurity reduced yields death of livestock high cost of production Poor germination Loss of pasture Low yields		
	Floods	Loss of lives	poverty malnutrition homelessness		
		Damage of properties	poverty homelessness high costs of reconstruction		
		Displacement Detoriation of health	deaths poverty reduced GDP		
KEIYO	Prolonged dry spell	crop failure water shortage increased temperatures	hunger malnutrition low farm produce feed shortage low farm produce animal and human conflict immigration heat wave pest &disease	Entire ward	women youth children PLWD elderly

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			late maturity (livestock)		
	Heavy rainfall	Floods mad/landslides destruction of infrastructure	siltation of dams soil erosion road destruction soil erosion death displacement loss of life and property		
	Pests & diseases	reduced farm produce increase farm operation cost	reduced income food shortage late maturity reduced income increase farm produce prices high cost of living		
BIDII	Floods	Soil erosion Leaching	displacement of human population destruction of infrastructure crop destruction livestock theft Siltation low crop production water pollution i.e	Along River Sabwani catchment area	women youth children PLWD elderly
	Prolonged dry spell	low farm productivity water scarcity lack of animal feeds	food insecurity crime high cost of food low attendance in schools Water wash diseases conflict over water resources low production of livestock		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			produce death of livestock High cost of animal feed low maturity rate		
	Erratic rainfall patterns	low crop production shortage of livestock feeds shortage of domestic water use	malnutrition livestock dead Water wash diseases covering long distances to fetch water		
ENDEBESS SUB-COUNTY					
ENDEBESS	Prolonged dry spell	low farm production water scarcity increased temperatures	low income diseases low farm production diseases human animal conflict water scarcity diseases(malaria, ringworms) crop failure	The entire ward	women youth children PLWD elderly
	Heavy rainfall	Floods destruction of infrastruc Mud slides	diseases soil erosion low crop production poor transportation loss of lives displacements displacements low farm production siltation of rivers and dams		
	Wind storms	destruction of infrastructure soil erosion	destruction of infrastructure soil erosion		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
		low farm production	low farm production		
CHEPCHOINA	Prolonged dry spell	low yields scarcity of water shortage of pasture	Hunger Diseases reduced income diseases(cholera, dysentery) human-animal conflict increased distance to access water point late maturity Death reduced milk production	The entire ward	Youth Women Elderly Farmers The business community
	Erratic rainfall patterns	delayed planting crop failure lack of pasture	Hunger attacks by pests and diseases late maturity leading to delayed income Hunger Poverty increased cost of production Death late maturity reduced milk production		
	Emergence of pests & diseases	low crop yield increase cost of farm production reduced livestock production	hunger diseases reduced income low income low crop yields reduced standard of living low income Hunger		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			malnutrition		
MATUMBEI	Prolonged dry spell	reduced water levels Human/Livestock conflict crop failure	long distance search for water human and wildlife diseases(jiggers, foot & mouth) loss of life (livestock and human) destruction of property food shortage low income	The Entire ward	Women Youth Children PLWD Elderly IPs
	Floods	soil erosion destruction of property water borne diseases Land slides	loss of soil fertility low income high cost of living Conflict Death High cost of treatment for Human &animals		
	Wind storms	destruction of property Air borne diseases wind erosion	high reconstruction cost injuries and death High cost of treatment for human &animals reduced man power destruction of plants		
CHERANGANY SUB-COUNTY					
SITTATUNGA	Pronged dry spell	Loss of pasture Reduced water supply	loss of livestock low crop production high cost of production low income death of animals high cost of production	The entire ward	Youth People with disability
	Pests and	Livestock diseases	low income		Women

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
	diseases	Low production Loss of animals	low food production low yields production low income outbreak of diseases Poverty hunger malnutrition high costs of production		Youth children PLWD elderly
	Erratic Rainfall	Destruction of food and pasture Drought Crop Failure	low yields production inconsistent rain patterns affecting farming calendar encourage growth of weeds low yields hunger high costs of production top soil loss reduces water supply damages infrastructure		
MOTOSIET	Prolonged dry spell	Decrease in food production	starvation weakening of immune systems poverty increase high costs of production poor yields low production	The entire ward	women youth children PLWD elderly
		Reduction of water supply	loss of livestock low income low production High cost of production		
		Reduction of pasture	Loss of livestock		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
		for livestock			
	Pests and diseases	Reduced crop yields	Hunger Malnutrition Poverty low income Poverty		
		Reduced livestock productivity	losses due to pest and diseases		
	Heavy Rainfall	Destruction of crops and seeds Livestock diseases Destruction of property/infrastructure Stagnant water	low yields low income from farm produce food shortage reduction of produce from livestock Losses due to treatment of livestock Poverty Poor transportation Waterborne diseases Spread of Malaria		
CHEPSIRWO-KIPTOROR	Prolonged dry spell	Loss of pasture	high production costs low production/low income value reduction	The entire ward	Women Youth People with disability Farmers Business community
		Livestock diseases	high cost of treatment consumption risk low income high cost of production crop diseases conflicts		
		Reduced water	Reduction in food production		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			Crop failure Loss of pasture		
	Pests and diseases	Low yields High cost of production	increase in poverty conflicts death endangers life affects learning Repair costs		
	Strong winds	Destruction of infrastructures Crop destruction Soil erosion	Endangers life Affects learning food shortage low income soil infertility low production high costs of production		
CHERANGANY-SUWERWA	Heavy Rainfall	Soil erosion	reduction of agricultural productivity land degradation soil infertility	The Entire ward	IPs Women Youth Elderly Farmers
	Prolonged dry spell	Water scarcity Loss pasture	reduced farm production human animal conflicts loss of life low yields loss of pasture high cost of production		
	Pests and diseases	High cost of production	High cost of living Loss of life		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
		Food shortage	Human animal conflicts		
MAKUTANO	Prolonged dry spell	Loss of pasture Wilting and drying up of crops Reduced water supply	low yields production loss of livestock High production cost high investment and capital low crop production low yields	Entire ward	Indigenous People Youth Women Elderly Farmers Business Community
	Pests and diseases	Livestock diseases crop diseases	death of animals poverty low yields food shortage wilting of crops high investment low production		
	Erratic Rainfall	crop diseases irregular germination livestock diseases	reduces yields high cost of living insecurity and crime low yields death of animals high investments		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
KAPLAMAI	Prolonged dry spell	Loss of pasture Water scarcity Low crop production	loss of livestock low farm production hunger crop failure Diseases low crop production high cost of living Poverty Malnutrition conflict between human beings and animals	Entire ward	Youth Women Elderly People with disability
		Soil Erosion Reduced food production Pests and diseases	Siltation Pollution soil vulnerable to erosion high cost of living Hunger livestock death livestock death low farm production high cost of production		
	Pests and diseases	High cost of living Low farm production	Hunger low income increase poverty loss of life Hunger low income		

WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			increase poverty		
SINYERERI	Pests and diseases	Low production High cost of living Livestock health deterioration	low income Malnutrition insufficient food Increased theft causes death of livestock poor health low milk production poor quality of products low income	The entire ward	The farmers Business Community Youth Farmers
	Prolonged dry spell	Loss of pasture Low production Water scarcity	Low livestock production High cost of production Death of livestock low quality produce reduce yields long distance in search of water low supply of food encroachment into riparian zones reduce crop production		
	Heavy Rainfall	Floods	destruction of infrastructure displacement of people destruction of crops		
		Soil erosion	loss of crops creation of gullies washing away of fertile soils		
		Hailstones	destruction of crops death of animals		

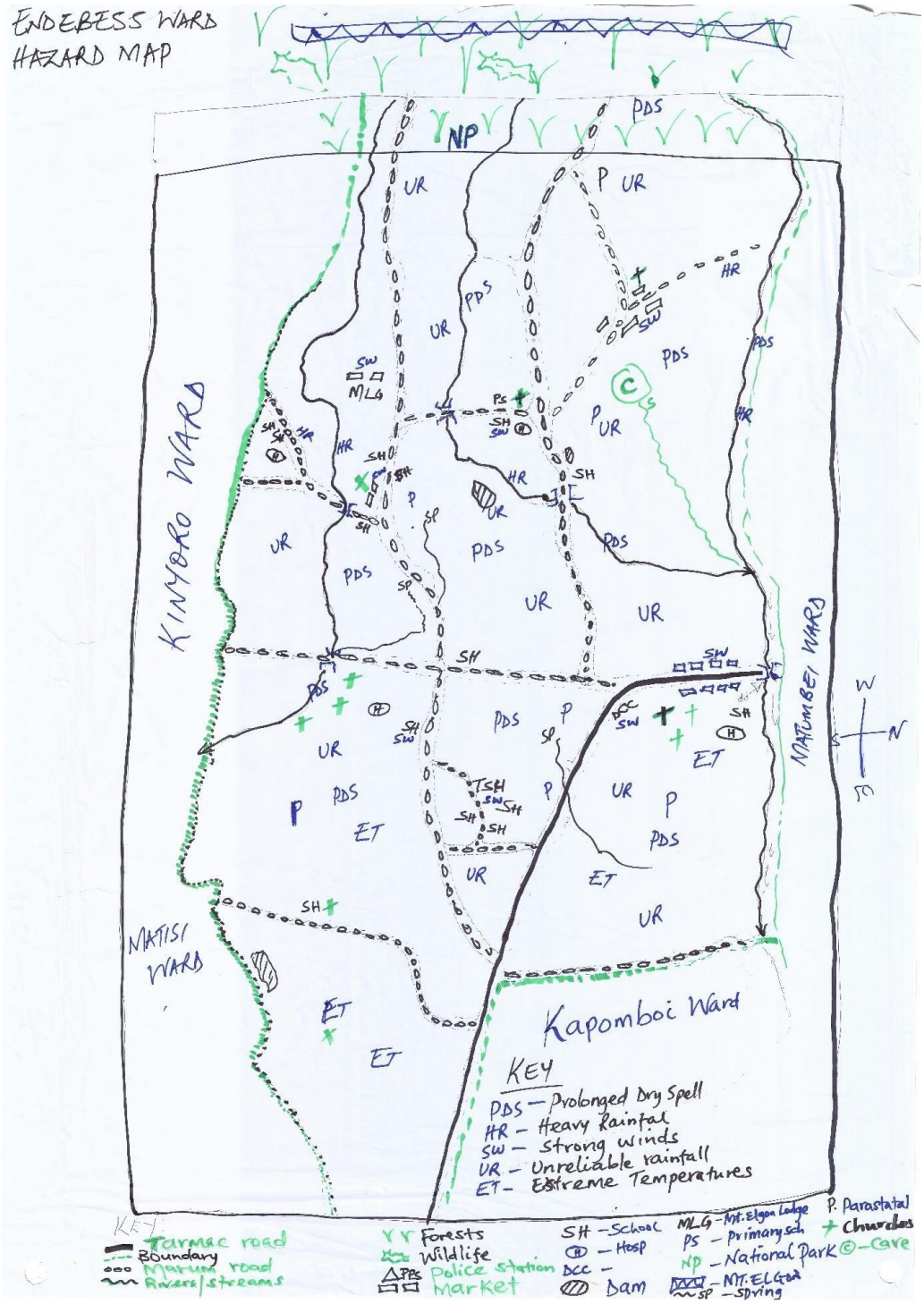
WARD	HAZARD	DIRECT IMPACT	INDIRECT IMPACT	VULNERABILITY	
				PLACES	COMMUNITY GROUPS
			destruction of shelter		

STEP	ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN

Annex V: Activity Plan

Step 1:	Constitution of the Technical Working Group						
Step 2:	Training of the TechnicalWG						
Step 3:	Stakeholder Mapping						
Step 4:	Preparation for Community Engagements						
Step 5:	Ward Based engagementson PCRA						
Step 6:	Data Analysis and Preparation for County Level Workshop on PCRA						
Step 7:	County Level Workshopon PCRA						
Step 8:	PCRA Report						

Annex VI: Ward Hazard Maps



Example of a Hazard Map

Annex VII: Training of Trainers

Annex VIII: Community Engagement on PCRA Process

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