



**Kwale County
County Climate Change
Action Plan
2023 - 2027**

FOREWORD

The devolved framework under the Constitution of Kenya (2010) has recognized the rights of communities to manage their own affairs and further their development. However, development aspirations under the devolution are threatened by climate change.

Every part of Kwale county experiences one form or another of the negative impacts of climate change, such as unpredictable and intense rainfall, droughts and flooding, land degradation, outbreak in human and livestock diseases, crop pests and diseases, rising sea levels and ocean acidification. These manifestations of climate change pose serious threats to unlocking economic opportunities.

The Climate Change Act of 2016 allocates climate change function to the two levels of government, underlining the fact that both have important contributions to make. Given the County's proximity to populations at risk, we have a particular responsibility to ensure that we build the resilience of our communities through both adaptation and mitigation actions.

Kwale County through its CIDP and sector plans has recognized the threat of climate change to socio-economic development. As a result, the County has prioritized climate change interventions in development planning. These measures are being implemented in climate-sensitive sectors, such as agriculture, water, physical planning and housing, health and waste management.

The preparation process of this Plan has been inclusive and involved stakeholders through extensive consultations that targeted input from the grassroots level. Public participation was undertaken in each of the 20 wards, multiple stakeholder engagements and validation of the Plan.

This Kwale County Climate Change Action Plan 2022 -2027 will therefore seek to capitalize on our gains on building community resilience and mainstream climate action across all our departments. I wish, therefore, to give my commitment to the process of implementation of this Plan. I call upon our development partners and the National Government to support the actualization of this Plan.

H.E FATUMA ACHANI

GOVERNOR

ACKNOWLEDGEMENTS

The County Climate Change Action Plan (CCCAP) was prepared with support from various institutions and individuals. First and foremost, we thank the County Environment Committee for their delegated mandate and support to in preparing the CCCAP. I also appreciate the role played by all the Members for their devoted coordination and support.

Further we acknowledge the support from National Government and Non-Governmental Agencies who provided their input to the CCAP during data collection, field surveys and workshops organized by the department and the consultant. This support is highly appreciated.

We acknowledge the critical role played by the County Climate Change Action Plan Taskforce team together with the consultant firm. Our Sincerest gratitude goes to Mr.Simon Nzuki of Envasses Environmental Consultants, who was the lead consultant in the preparation of this Plan together with his team.

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LIST OF ACRONYMS

CBO	Community Based Organization
CCAP	Climate Change Action Plan
CEC	County Environment Committee
CFAs	Community Forest Associations
CIDP	County Integrated Development Plan
COVID-19	Corona-Virus Disease 19
EACC	East African Coastal Currents
ECC	Equatorial Counter Currents
ENRM	Environmental and Natural Resource Management
FLR	Forest Landscape Restoration
FOLAREP	Forest and Landscape Restoration Implementation Action Plan
GDP	Gross Domestic Product
GIS	Geographical Information System
GoK	Government of Kenya
ICZM	International Coastal Zone Management
KALRO	Kenya Agricultural and Livestock Research Organization
KEFRI	Kenya Forest Research Institute
KeFS	Kenya Fisheries Service
KEMFRI	Kenya Marine and Fisheries Research Institute
KEMSFED	Kenya Marine Fisheries and Socio-Economic Development
KeNHA	Kenya National Highways Authority
KFS	Kenya Forest Service
KNBS	Kenya National Bureau of Statistics
KERA	Kenya Rural Roads Authority
KURA	Kenya Urban Roads Authority
KWS	Kenya Wildlife Service
NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
PVCA	Participatory Vulnerability Capacity Assessment
SC	Southern Currents
SDGs	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change
WRA	Water Resources Authority
WRUAs	Water Resource Users Associations
WWF	World Wide Fund for Nature

DEFINITION OF TERMS

Adaptation refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Adaptive Capacity is the ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behaviour and in resources and technologies.

Carbon market is the trading system through which countries or other entities may buy or sell units of greenhouse gas emissions in an effort to meet their national limits on emissions, either under the Kyoto Protocol or under other agreements.

Carbon sequestration is the process of removing carbon from the atmosphere and depositing it in a reservoir or “sink”, such as soil or trees.

Climate Change is the long-term increase in the earth's average surface temperature and the large-scale changes in global, regional, and local weather patterns that result from that increase, caused by a significant increase in the levels of greenhouse gases that are produced by the use of fossil fuels. Climate Finance refers to local, national or international financing that may be drawn from public, private and alternative sources of financing, and is critical to addressing climate change because large-scale investments are required for adaptation and mitigation.

Climate Resilience refers to climate actions that contribute towards reducing vulnerability to climate change, making sure that the impacts of climate change are avoided or cushioned, and enabling people to respond to climate risks.

Greenhouse gases refers to the atmospheric gases responsible for causing global warming and climate change. The major GHGs are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Less prevalent -- but very powerful -- greenhouse gases are hydro fluorocarbons (HFCs), perfluorocarbons (PFCs) and Sulphur hexafluoride (SF₆).

Low Emissions Development Pathway refers to a development plan or strategy that encompasses low-emission economic growth. Transitioning to this pathway means taking actions, where possible, to encourage GHG emissions that are lower than business-as-usual practice; and reducing the human causes of emissions by moving toward a resource efficient economy that is as low-emissions as possible and enhancing carbon sinks.

Mitigation refers to interventions aimed at reducing the sources or enhance the sinks of greenhouse gases. Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, and expanding forests and other "sinks" to remove greater amounts of carbon dioxide from the atmosphere.

Vulnerability is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude and rate of climate variation to which a system is exposed, its sensitivity and its adaptive capacity.

EXECUTIVE SUMMARY

The Kwale County Climate Change Action Plan (CCCAP) 2022-2027 is prepared pursuant to Section 19 of the National Climate Change Act, 2016, which mandates counties to develop their climate action plans and integrate the National Climate Action Plan (NCCAP) into their five year-year County Integrated Development Plans (CIDPs) and county sector plans.

The County is endowed with immense and diverse multiple-use resources which are of great socio-economic significance to the local community and the county economy at large. These range from water resources (rivers, dams, water pans and boreholes), terrestrial and marine wildlife, terrestrial forests, mangroves, seagrass beds, coral reefs, sea weeds and open sea marine resources among others. Besides supporting livelihoods, the resources also drive various economic activities including tourism, agriculture, maritime and fisheries among others, which make significant contributions to the county and national economy.

The resources are however under threat from climate change hazards such as drought, floods, environmental degradation pests and diseases, human and human-wildlife conflicts, increased temperatures, sea level rise and coral bleaching. These disasters threaten food security through disruption of cropping, marketing and overall ecosystem structures. In recent decades, episodes of drought-induced food shortage and famine have directly led to resource stress manifested in crippling conflicts which have resulted in millions of casualties, internally displaced persons and refugees, posing dilemmas for long-term solutions. Such conflicts related to ‘complex’ emergencies have been creating need for massive and prolonged relief operations and leading to heavy use of social and economic assets in mitigation, thus derailing the region’s aspiration for sustainable economic and social development. Additionally, according to Kwale County Government, the County is only 30% efficient to mitigate climate change hazards thus the need to integrate climate change adaptation and disaster risk management (Source: Kwale County Hazard Atlas, 2017).

Therefore, there is urgent need to reverse this trend and poor performance by mainstreaming climate change actions across county government policies, plans and programmes and raise awareness among government, private sector, civil society and the general public. The CCCAP 2022-2027 is consequently a tool that aims to galvanize, fund-raise and mainstream the proposed climate change actions into the county sectoral plans to provide for a climate resilient County to achieve the provisions of the Kenya Constitution 2010.

Adaptation, mitigation and enabling actions have been prioritized in the CCCAP 2022-2027 in seven areas including disaster risk management, food and nutrition security, water and blue economy, forestry, wildlife and tourism, health, sanitation and human settlements, manufacturing, energy and transport. They seek to proactively manage climate change impacts in a way that results in adaptation and sustainable development

The CCCAP 2022-2027 proposes an implementation matrix which outlines the priority actions under each of the seven areas, expected outputs/outcomes, key performance indicators, responsible institutions, targeted groups, timeframe and budget.

The Implementation matrix will be a critical and important tool for informing the development of project concepts and proposals, mobilizing, allocating and utilizing resources during plan implementation, efficiently and effective management and coordination of plan implementation process, soliciting collaboration and support from partners and all other stakeholders in the coastal zone, monitoring progress, evaluating results/outputs and assessing outcome/impact, documentation and dissemination of results of impact and facilitating mid-term and end-of-plan reviews/evaluations.

The success of the CCCAP 2022-2027 lies in its implementation through actualizing the recommended actions under each of the seven priority areas. To ensure effective implementation, the county government will need to mobilize adequate resources, strengthen departmental capacities and synergies between the county and national government institutions and non-state actors, mainstream the CCCAP into sectoral plans and scale up key stakeholder involvement. The plan will be implemented over a period of 5 years (2022 – 2027) through Annual Work Plans (AWP) and with support from other sectoral plans as well as development and implementation of a new County Integrated Development Plan (CIDP 2022-2027).

1 BACKGROUND AND CONTEXT

1.1 Introduction

The Kwale County Climate Change Action Plan (CCCAP) 2022-2027 is prepared pursuant to Section 19 of the National Climate Change Act, 2016, which mandates counties to develop their climate action plans and integrate the National Climate Action Plan (NCCAP) into their five year-year County Integrated Development Plans (CIDPs) and county sector plans.

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The resources are however under threat from climate change hazards such as drought, environmental degradation, floods, emergence of livestock parasites and diseases, human diseases, crop pests and diseases, human and human-wildlife conflicts, increased temperatures, sea level rise, soil erosion and strong winds. These disasters threaten food security through disruption of cropping, marketing and overall ecosystem structures. In recent decades, episodes of drought-induced food shortage and famine have directly led to resource stress manifested in crippling conflicts which have resulted in millions of casualties, internally displaced persons and refugees, posing dilemmas for long-term solutions. Such conflicts related to ‘complex’ emergencies have been creating need for massive and prolonged relief operations and leading to heavy use of social and economic assets in mitigation, thus derailing the region’s aspiration for sustainable economic and social development. Additionally, according to Kwale County Government, the County is only 30% efficient to mitigate climate change hazards thus the need to integrate climate change adaptation and disaster risk management (Source: Kwale County Hazard Atlas, 2017).

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1.1.1 Approach used in developing CCCAP 2022-2027

The process of preparing the CCAP is highlighted under Section 19 of the National Climate Change Act, 2016. The section recognizes the critical role played by county governments in mainstreaming climate change actions into government functions. The aim is to integrate climate into local development planning and facilitate partnership between communities and county governments in a socially inclusive and sustainable manner. To implement the legislative provisions, Kenya has developed the National Climate Change Action Plan preparation guidelines 2018-2022.

These guidelines formed the basis for the process adopted in the preparation of the CCAP. Initially, the process focused on resource mobilization, stakeholder mapping, identification and mobilization which were followed by data collection on the climate change hazards and required intervention measures as well as the current activities that enhance climate change resilience.

Data collection methods were literature review (focusing on the Participatory Vulnerability and Capacity Assessments Reports for the 20 wards in Kwale County, 2022, the Kwale County Hazard Atlas Report, 2017, the National Climate Change Action Plan, 2018-2022 and the Kwale County Sectoral Plans 2018-2028). Site visits were carried out between March and May 2022 to validate data and information obtained from literature review as well as address gaps. During the site visits, Key Informant Interviews (KIIs) were also carried out with deliberate bias on women, youth, ethnic minorities, people living with disabilities and other marginalised and vulnerable groups as part of the validation and data gaps filling process. Upon conclusion of data collection and analysis, a draft CCAP was prepared and subjected to stakeholder review and validation process after which a final plan was prepared and submitted to the County Government of Kwale for further action pursuant to Section 19 of National Climate Change Act, 2016.

1.2 Underlying Climate Resilience Context

1.2.1 Impacts of Climate Hazards in the County

Kwale lies in the Arid and Semi-Arid region of Kenya. This renders the County vulnerable to acute human suffering and loss of development assets brought about by climate hazards which are caused by both natural and human induced hazards, and frequently by a combination of both. Aside from the foremost climate hazard of drought, other ‘slow onset’ climate hazards include land degradation, ocean acidification and sea level rise whose consequences of which can be equally disastrous to existing food systems. Major ‘sudden onset’ climate hazards such as floods, landslides, Conflicts (both natural resource based and human wildlife), Human diseases and livestock diseases coupled with resulting vulnerabilities of the marginalised population and ecosystems have been threatening the County.

Climate hazards threaten food security through disruption of cropping, marketing and overall ecosystem structures. In recent decades, episodes of drought-induced food shortage and famine have directly led to resource stress manifested in crippling conflicts which have resulted in thousands of casualties, internally migrations, posing dilemmas for long-term solutions. Such conflicts related to ‘complex’ emergencies have been creating need for massive and prolonged relief operations and leading to heavy use of social and economic assets in mitigation, thus derailing the county’s aspiration for sustainable economic and social development.

Based on the assessments done by different studies in Kwale County as well as the Ward based field assessments carried out under the Participatory Vulnerability Capacity Assessment exercise highlighted the above mentioned climate hazards impacting the communities most.

1.2.2 County Climate Hazard Map

DROUGHT PREVALANCE AND PHYSICAL EXPOSURE

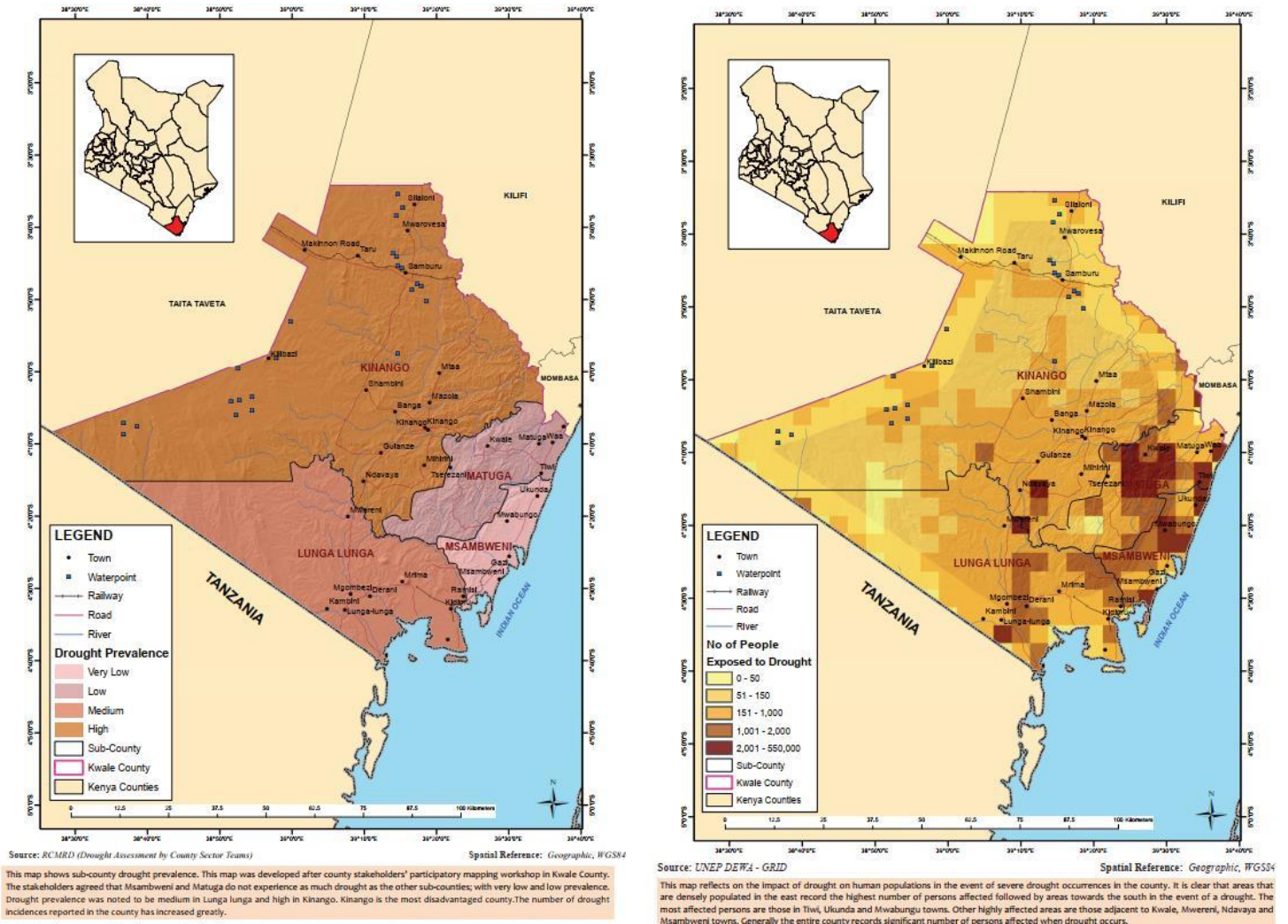


Figure 1 Drought Prevalence and Exposure

Drought is considered by many to be the most complex but least understood of all natural disasters. It affects more people than any other hazard because its effects (famine in particular) accumulate slowly over a considerable period of time and may linger for years after the termination of the event. The degree to which a population is negatively affected by drought depends largely on its vulnerability and coping mechanism options available to them.

In Kwale, major droughts occur every 10-15 years while minor ones after 2-4 years (Makoti et al, 2015). Based on the above, it is evident that the people already have a coping strategy, regardless of its workability, due to the frequency of the drought as a hazard.

Kinango Sub-county has about 60% of its residents being food insecure, a situation that is directly linked to adverse climatic condition with persistent drought as the main driver. As a result most of the households depend on relief food and food for assets. Relief food may solve the immediate hunger though it's neither adequate nor sustainable. This form of dependency increases the vulnerability of the resource poor households in Kwale County.

Drought years	Description	Local Name
1965 – 1967	Meteorological drought	Mutunguru
1974	Agricultural drought	
1980 – 1984	Trekking to Msambweni to buy yellow maize flour	Nzala ya Njenga
1987	Food was scarce such that people didn't welcome visitors	Nzala ya ndugu si mutu
1994 – 1996	Wheat flour was available at affordable cost while maize flour was scarce	Nzala ya chapatti Unga wa Muche
1999 – 2000	Maize was sold in maximum limit of 2kg tins	Nzala ya magorogoro
2001 – 2005	High frequency of deforestation through charcoal burning	Nzala ya Katoto
2006 – 2008	Agricultural drought	
2016 – 2017	Agricultural drought	
2019 – 2022	Hydrological drought	

Table 1 Community Perception on Drought trends

Drought also causes a decrease in the quality and quantity of natural resources such as forests and water both of which contribute to the overall sustainability of the community. Alternative sources of livelihood such as charcoal burning to escape drought has an overall trickling effect of increase of the exposure to other hazards such as landslides due to reduced ground cover. Forest and range fires increase substantially during extended droughts, placing human and wildlife populations at higher levels of risk. During drought spells, loss of pasture and drying of water pans in Kwale County are inevitable. As a consequence, farmers make long distances as far as to the southern border with Tanzania in such of the two. These results to communal conflicts over pasture and water resources.

Continuous impacts of hazards such as drought compel communities to seek alternative sources of livelihoods or different mechanisms of harnessing available resources. It is with this respect that communities seeking to escape drought prone areas, encroach into wetlands or cut down trees to create space for cultivation of crops especially in the water catchment areas which are deemed fertile. The youth and able-bodied persons engage in other income generating activities such as sand harvesting. If done continuously and on a large scale, then the results are degraded rivers from deeper river beds leading to bank erosion and enlarged river mouths. The worst case scenario is saline water intrusion from the sea. When this contaminated water is used for domestic purpose in a considerably long time, then health implications such as fluorosis may affect the community. Others embrace charcoal and firewood production for sale. Although this results into quick cash to households, its impact on land quality through such consequences as land degradation and global warming cannot be over emphasized. The overall result of such poor land use activities are Environmental degradation. In many cases this is exacerbated by population pressure and migration of the affected communities.

LAND DEGRADATION PREVELANCE AND LANDSLIDE RISK

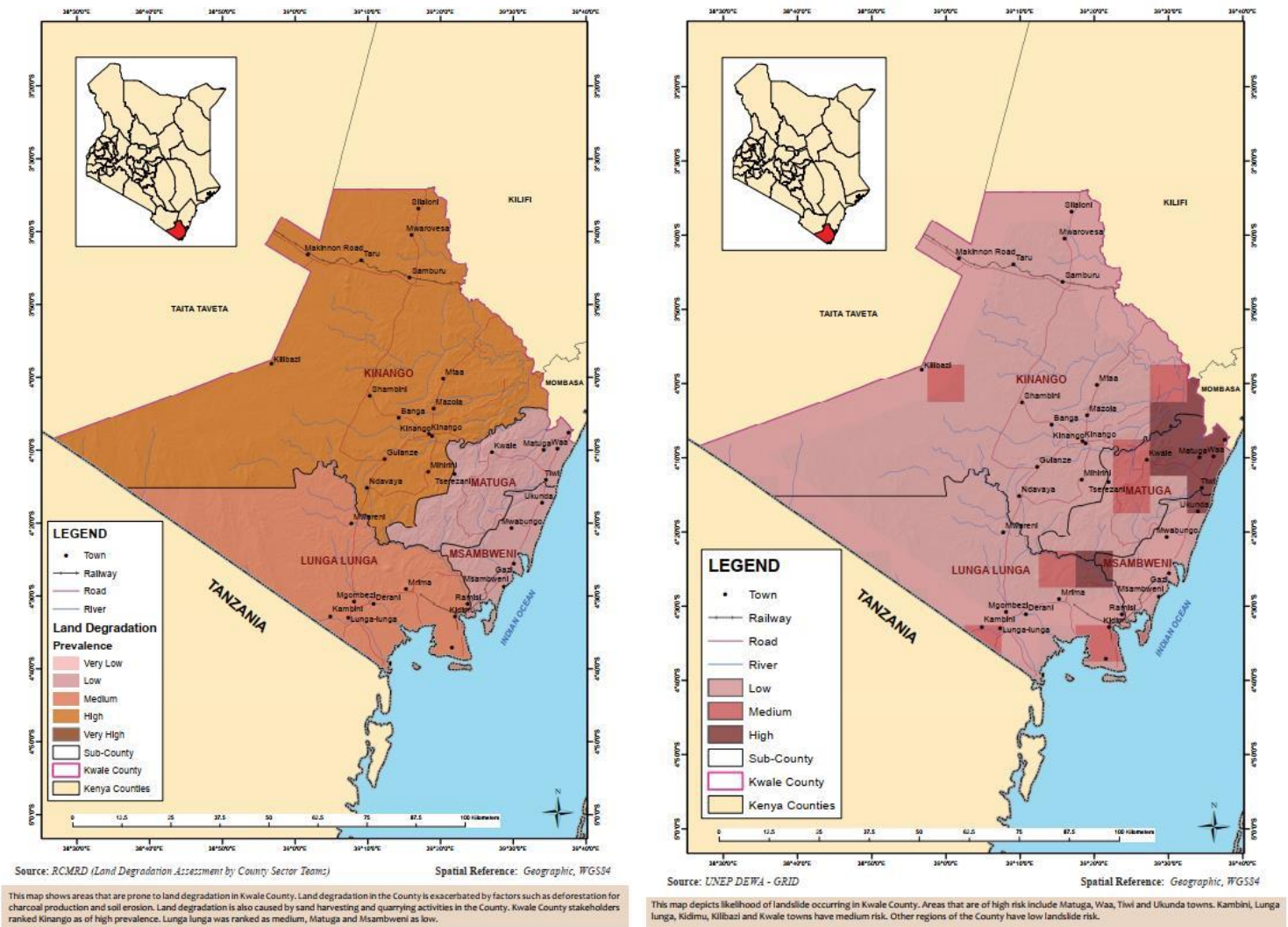


Figure 2 Land degradation prevalence and Landslide risk

Kwale County falls in the semi-arid region of Kenya. The aridity of the land makes it fragile and prone to degradation exacerbated by climate change and unfavourable climatic conditions such as drought and floods. Drought reduces vegetation cover while floods erode surrounding soil and uproot vegetation (UNDP, 2013). Floods can also leave behind toxins and pollutants picked along the way. Some of these pollutants can lead to degradation of land through deposit of plastics and salts. Anthropogenic activities such as sand harvesting and quarrying in the county degrade a lot of land too. Unsustainable land use is believed to be the number one cause of land degradation in Kwale County. Kwale County’s first integrated development plan states that logging (charcoal burning), solid waste, overgrazing and mining (sand harvesting) are the major causes of degradation in the County. Increasing human population into Kwale County and sub-division of land into uneconomical parcels together with increased farming put excess pressure on land leading to degradation (UNEP,2009). Even though landslides are considered a minor hazard in the County, it occurs in some areas. One of these regions is Bombo, Kiteje sub-location, Waa and Ng’ombeni ward in Matuga sub-county.

HUMAN DISEASE PREVALANCE AND LIVESTOCK DISEASE PREVALANCE

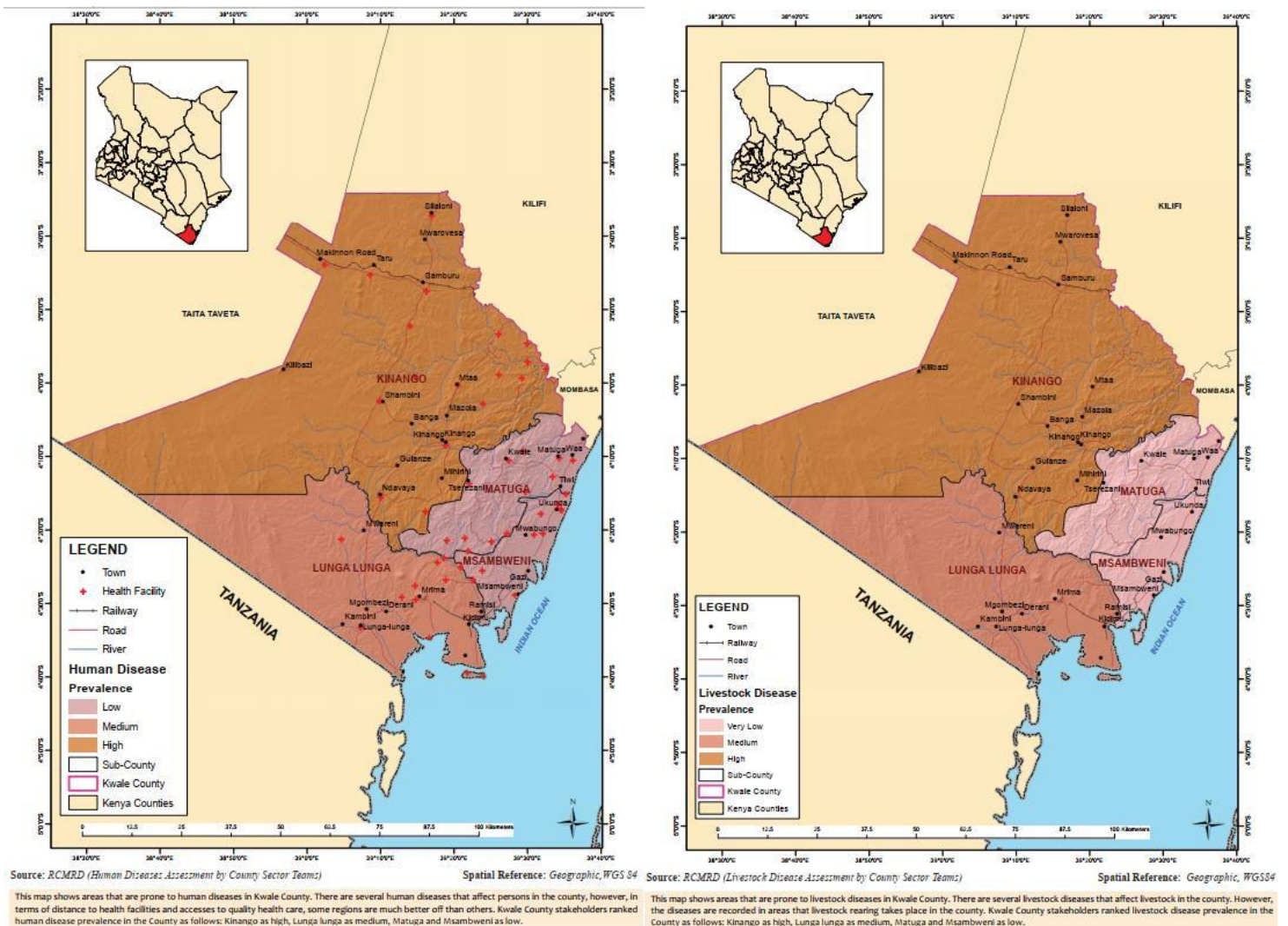


Figure 3 Human diseases prevalence and livestock disease prevalence

Disease is a particular abnormal, pathological condition that affects part or all of an organism (Dorland's Medical Dictionary). Common diseases that affect humans, livestock and crops in Kwale County include: malaria, schistosomiasis, diarrhoea, New Castle Disease, foot and mouth among others.

The sub-sectors in the health sector include Medical Services, Public Health and Sanitation. Poor health services in Kwale County are attributed to inadequate health workers; high disease incidences of preventable diseases such as malaria, diarrhoea, and HIV/AIDS; drugs and substance abuse due to lack of employment opportunities for the youths; inadequate medicines due to poor supply chain for medicines and inadequate health facilities and services.

The persistent water shortage in Kwale County depresses agricultural output and income by inhibiting the adoption of irrigation techniques and watering systems for livestock.

Inadequate supply of clean water increases occurrences of water-borne diseases and illnesses among the local population in most parts of the county.

The unreliability of the water supply system is mainly occasioned by ageing infrastructure and delayed upgrades which are not in tandem with population trends and other socio-economic demands. Existing water systems are centred on urban/commercial centres which create disproportionately low access and water portability in sparsely populated rural areas. Household walk long distances to fetch water for domestic and economic uses. About 50 per cent of the population living in rural areas access water from water sources that are more than 2 km away. In addition, in some areas where the water levels are too high, the water is contaminated through pit latrines. Along most settlements close to the Indian Ocean and in some of the semiarid areas the underground water is saline and hence not fit for domestic use.

The toilets and sanitation coverage is as low at 41.4 percent and coupled with poor solid waste management leads to environmentally related diseases like cholera and dysentery which pose serious health hazard (www.kwalecounty.gov.com). Urban centres such as Diani/Ukunda, Msambweni Kwale and Kinango do not have an urban waste management system and household either use pit latrines or individual pits.

Livestock production is the main economic activity in the rangeland where local breeds of both cattle and small ruminants mainly goats are kept in large numbers with very few crosses of improved breeds. Though livestock population are high, production has remained low due to low quality breeds compounded with poor husbandry and high incidences of pests and diseases. Livestock diseases compromise animal welfare, reduce productivity, and can infect humans.

CROP DISEASE PREVALANCE AND FLOOD PREVALANCE

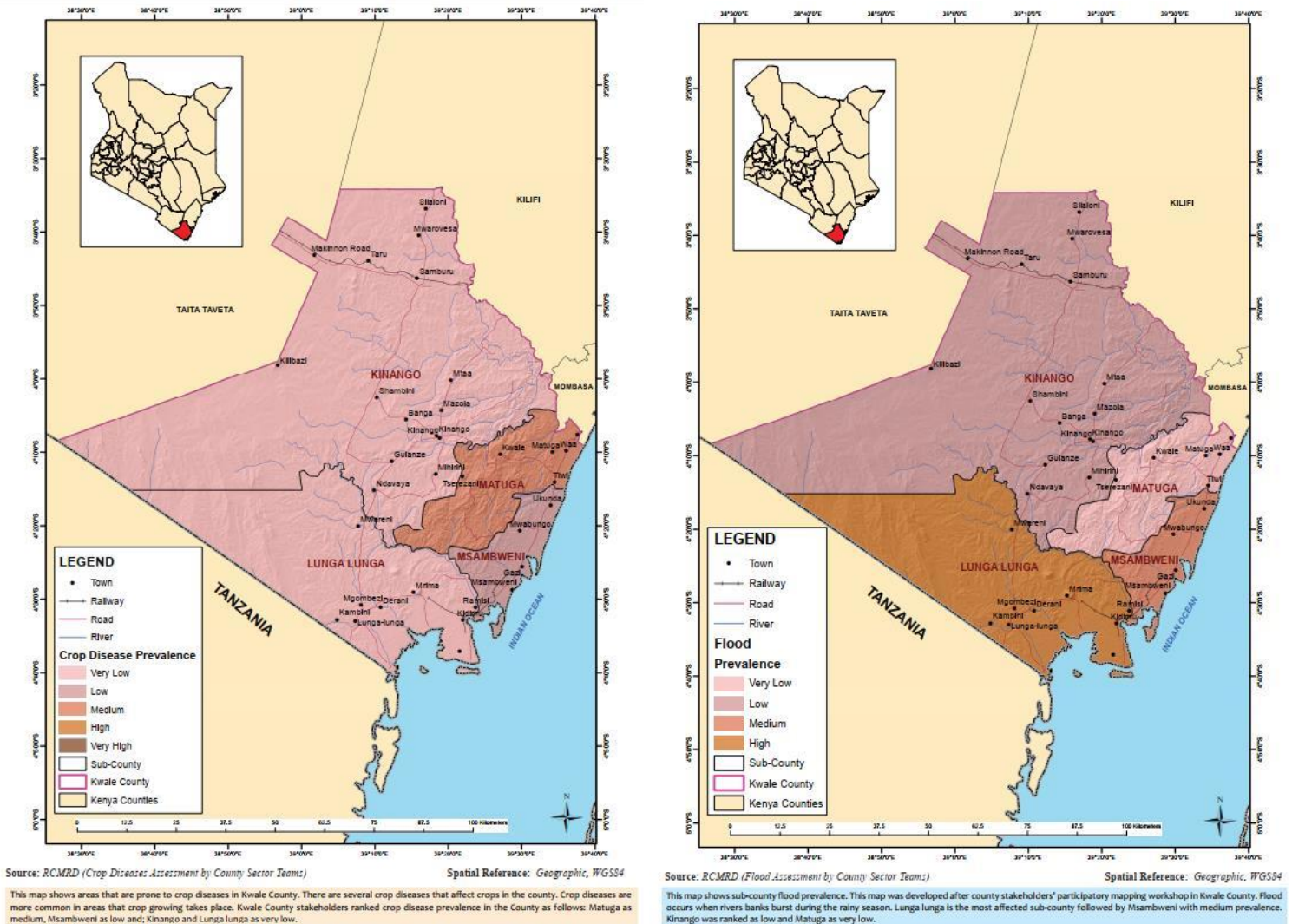


Figure 4 Crop disease prevalence and Flood prevalence

The main food crops grown in Kwale County include: maize, cassava, sweet potatoes, beans, peas and green grams while main cash crops grown include: cashew nuts, coconut, sugarcane, bixa and semi-commercial crops like citrus, passion and mangoes. Even though there is high production potential, of these crops, current yields are very low due to poor agronomic practices.

Common crop pests and diseases include:

- Fall Army worms
- Maize stalk borers
- Cut worm
- Termites
- Cassava Brown Streak Disease
- Maize Streak
- Cassava Bacterial Blight Disease
- Cassava Mosaic Disease

HUMAN CONFLICTS PREVALANCE AND HUMAN WILDLIFE CONFLICTS PREVALANCE

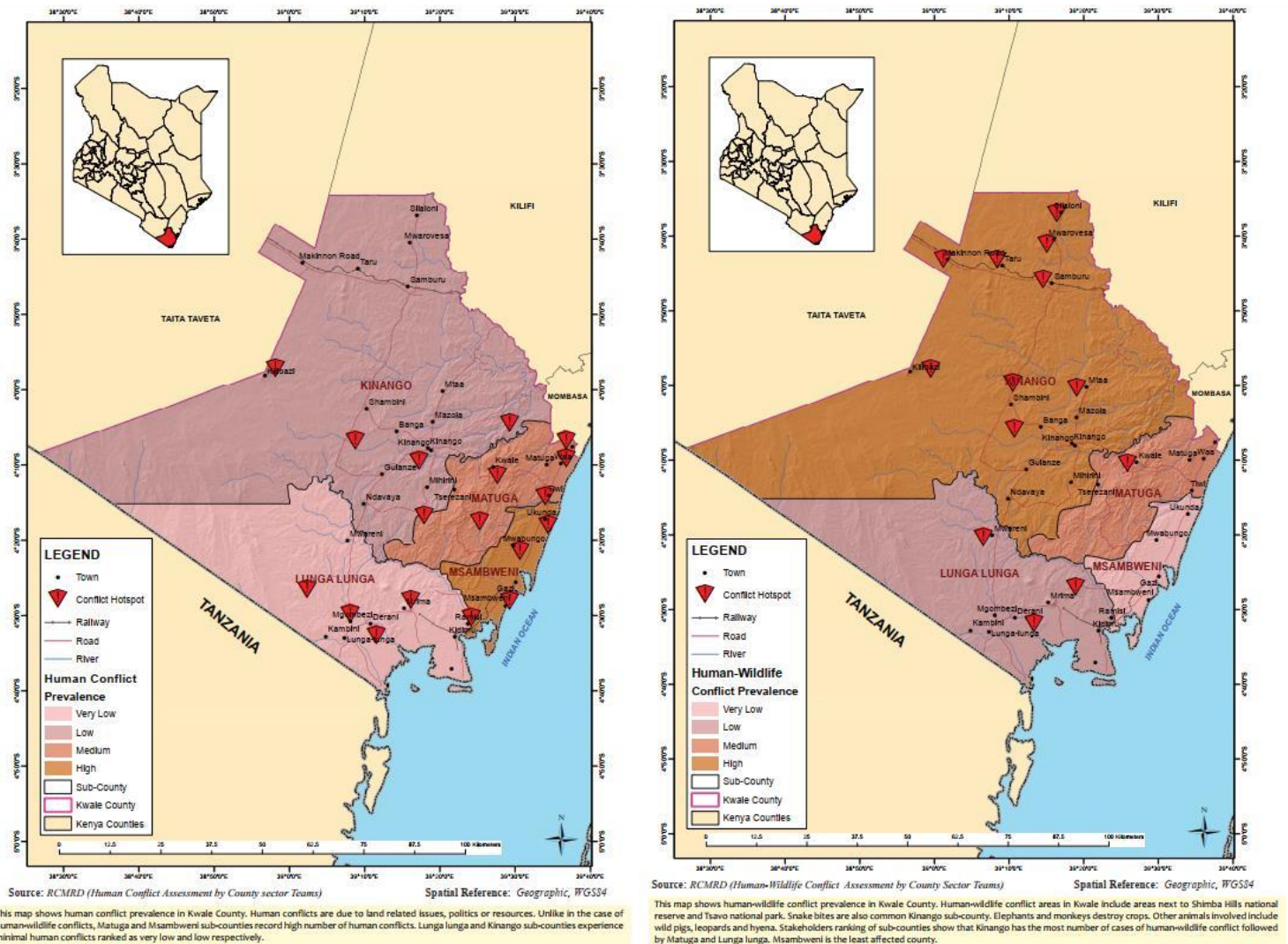


Figure 5 Human Conflict prevalence and Human Wildlife prevalence

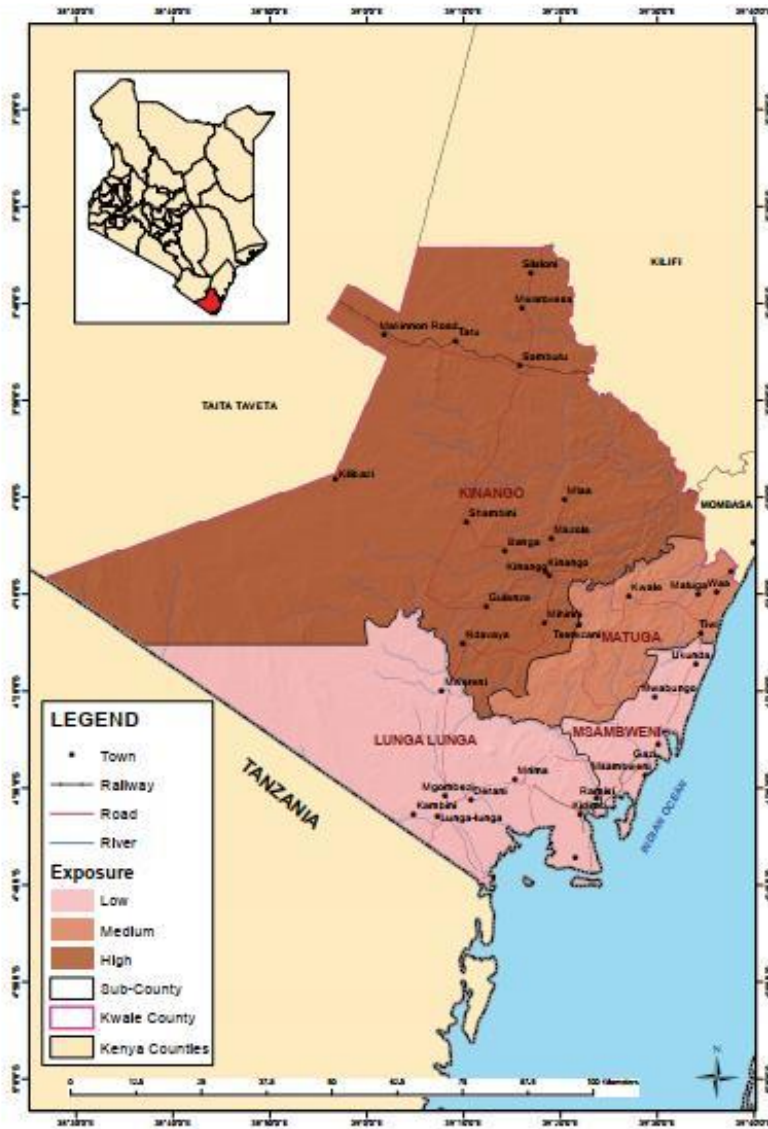
Natural Resources conflict is the predominant type of conflict among pastoral communities and along the international borders; Competition over commonly shared resources is mainly pastoral land and water is, in part, fueled by the cultural practice of nomadic pastoralism. The governance of these areas differs from community-to-community, leading to inherent contradictions, accusations of favoritism, and exploitation and discrimination against other communities.

Land is a dominant factor in the Coastal area, but more frequent in Kwale County. It is also emerging as a flashpoint in localities with valued resources, such as minerals (for example, Titanium Mining in the Kwale). Most of the land is communally owned and the residents lack title deeds. Land adjudication at times is not transparent and leads to further conflicts among the residents of Kwale County. Boundary issues also contribute to conflicts in the County. Land issues are common in all the six sub-counties in Kwale. In addition, the management of land issues shows signs of vested political interests, with local communities rarely involved in the decision-making process about how land is allocated.

Human-wildlife conflict, is a growing problem in today's crowded world, and can have significant impacts on both human and wildlife populations. Human wildlife conflict occurs when there is close interaction between wild animals and human beings, resulting to injuries, death, predation, transmission of diseases and even human threats. Human-wildlife conflicts also undermine human welfare, health and safety, and have economic and social costs. Nuisance encounters with small animals, exposure to zoonotic diseases, physical injury or even death caused by large predators' attacks have high financial costs for individuals and society in the form of medical treatments to cure and prevent infections transmitted from animals. Humans can be economically affected through destruction and damage to property and infrastructure (e.g. Agricultural crops, orchards, grain stores, water installation, fencing, pipes), livestock depredation, transmission of domestic animal diseases, such as foot and mouth. Negative social impacts include missed school and work, additional labour costs, loss of sleep, fear, restriction of travel or loss of pets (Hwa-Elephant Conflict Working Group, HECWG). In Kwale County, human wildlife conflicts involve elephants from Tsavo and Shimba Hills that destroy crops. Monkeys are also many and just like the elephants feed on crops. Other animals like Wild pigs, leopards and hyena a threat to people and livestock by feeding on them or causing injuries. Snake bites are common in Kinango sub-county. Black mamba, cobra and puff adder were mentioned by residents as the species that cause injuries and death. Snake bites are common in the entire County. Poisonous snakes like Black mamba, cobra and puff adder were mentioned by residents as the species that cause injuries and death.

The Kenya wildlife service (KWS) has tried to fence Shimba Hills reserve but some areas are still unfenced. Residents living next to Shimba Hills have formed a Human-Wildlife Conflict Mitigation Committee that digs trenches to prevent elephants from crossing from the park to their farms. Some of the challenges include relocation of wild animals by KWS from one park to another. Some of these animals especially elephants try to find their way back to their home parks causing massive destruction to crops. Hyenas from other regions feed on livestock in Kinango sub-county. Compensation by KWS takes too long and involves a long process which discourages the locals.

CLIMATIC HAZARDS EXPOSURE MAP



Sub-County	Flood	Drought	Land Degradation	Human Conflict	Human-Wildlife Conflict	Fire	Total	Scale Aggregation
Matuga	1	2	2	3	3	4	15	2
Kinango	2	4	4	2	4	1	17	3
Lunga Lunga	4	3	3	1	2	1	14	1
Msambweni	3	1	2	4	1	3	14	1

SCALE CONVERSION	
0	1
1	2
2	3
3	3

Source: RCMRD (Vulnerability Assessment- Kwale County)

Spatial Reference: Geographic, WGS84

This map is a by-product of stakeholders' workshop held in Kwale County. It shows sub-county access to education facilities. Msambweni was ranked as the most privileged county with high access to education, followed by Lunga lunga. Kinango and Matuga have the least access to education. Ranking was based on number of schools, distance to schools and teacher to pupil ratio.

Figure 6 Climate hazards exposure map

1.2.3 Summary of Differentiated Climate exposure and Vulnerability of key groups and Livelihoods in the County

Climate Hazard	Exposure levels	Vulnerability of key groups	Livelihoods impacted
Drought	High	The poor The elderly Infants and children Women People living with disabilities	Livestock farming Mixed farming Non formal employment
Land degradation	High	The poor Women Infants and children People living with disabilities	Livestock farming Mixed farming Water accessibility
Extreme Heat	High	The poor and homeless The elderly Infants and children Those with pre-existing medical conditions The mentally ill Women Agricultural workers those with outdoor jobs	Livestock farming Mixed farming
Human Diseases	Medium	The poor The elderly Infants and children Women	Non formal employment Livestock farming Mixed farming Formal employment
Livestock diseases	Medium	Herders Children Women The poor	Livestock farming
Crop pest and diseases	Medium	Farmers Children Women	Mixed farming
Human to human conflicts	Low	Pastoralists Ethnic minorities Women Children	Livestock farming Mixed farming
Human Wildlife Conflicts	Medium	Farmers Pastoralists Children Women	Livestock farming Mixed farming
Ocean acidification	High	Fisherfolks Beach Management Units	Fisheries Tourism
Sea level rise	Medium	Fisherfolks Beach management Units	Fisheries
Strong winds	Medium	Farmers The Poor	Mixed farming

Table 2 Summary of Climate Hazard exposure, vulnerability and livelihood impact

1.3 Brief Overview of Climate Change Actions in the County

1.3.1 Mainstreaming of NCCAP in County Actions

The CCCAP 2022-2027 seeks to reduce the impacts of climate change and increase the resilience of people to cope with the impacts. The thematic areas mirror the National Climate Change Action Plan 2018 – 2022. Adaptation, mitigation and enabling actions have been prioritized in the CCCAP 2022-2027 in seven areas including disaster risk management, food and nutrition security, water and blue economy, forestry, wildlife and tourism, health, sanitation and human settlements, manufacturing, energy and transport. They seek to proactively manage climate change impacts in a way that results in adaptation and sustainable development.

1.3.2 Climate Change in CIDP

The Kwale County CIDP 2018-2022 takes cognizance of the need for mainstreaming Climate Change across all county departments. Kwale County through its CIDP and sector plans has recognized the threat of climate change to socio-economic development. As a result, the County has prioritized climate change interventions in development planning. These measures are being implemented in climate-sensitive sectors, such as agriculture, water, physical planning and housing, health and waste management.

1.3.3 Other key climate actions/strategies in the County

As it is the organizations mentioned have a coping strategy that involves:

- Supplementary feeding programme
- Vitamin A supplementation
- Disease surveillance
- Young Child Feeding
- Defaulter tracing
- Integrated health and nutrition outreaches
- Rapid nutrition assessment
- School feeding programme
- Water trucking to schools
- Drip irrigation farming
- Cash for Asset
- Conservation agriculture
- Construction of water reservoirs
- Growing of drought resistant varieties
- Construction of soil and water conservation structures for crop production
- Training for enhanced alternative livelihoods options and opportunities is necessary
- Integrated management of Acute malnutrition at facility level -80%
- Vitamin A supplementation at facility level
- Immunization at facility and outreach
- Treatment of the sick at facility level

- Deworming at facility level and schools
- Integrated health and nutrition outreaches
- Disease surveillance
- Rapid nutrition assessment
- Provision of Veterinary expertise and conducting regular
- disease surveillances and community awareness programs on a regular basis
- Livestock vaccination
- Vector control –Dips
- Livestock trainings and Veterinary extension services to all livestock keeping communities
- Deworming
- Breed improvement programmes
- Disease Surveillance
- Indigenous traditional knowledge and modern methods of resolving conflicts.

2 POLICY AND LEGAL FRAMEWORK

2.1 Introduction

Climate Change is a global problem and requires global solution, Kenya has committed herself in the international efforts to reduce national emissions and adapt to the impacts of climate change. Consequently, Kwale County has taken an initiative to be an active key player in the national climate change governance systems and provisions in the Climate Change Act, 2016. Therefore, this chapter provides details of the enabling policy and legal frameworks for the foundation of CCCAP 2022-2027.

2.1.1 Legal and Policy Framework

2.1.2 The Constitution of Kenya, 2010

The Constitution of Kenya, 2010 is the foundation of the institutional and legal framework for climate change action. Article 10 sets out the national values and principles of governance for all state organs, public officers and all persons whenever making or implementing public policy decisions including those related to climate change. Article 42 states that 'every citizen has right to a clean and healthy environment which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures particularly those contemplated in Article 69.'

2.1.3 The Climate Change Act, 2016

The Climate Change Act, 2016 is the key legislation that guides Kenya's climate change response and provides legal foundation for NCCAPs and CCCAP. The Act adopts a mainstreaming approach that includes climate change considerations and actions into all sector functions and in County Integrated Development Plans. The Act also establishes the Climate Change Fund – a financing mechanism for priority climate change actions and interventions.

2.1.4 Kenya Climate Smart Agriculture Strategy (KCSAS) 2017-2026

Climate Smart Agriculture is a tool for implementing the Nationally Determined Contributions (NDC) for the agriculture sector and will require both domestic and international support. The overall objective of the strategy is to build resilience of agricultural systems, adapt to climate change and minimize the GHGs emissions. The implementation of this strategy will be mainly by the County Governments.

2.1.5 National Drought Management Authority Act No. 4 of 2016

The Act of parliament establishes the National Drought Management Authority and defines its duties and powers. The responsibilities include:

- Coordinating the government's drought response and climate change initiatives
- Designing and implementing drought and climate resilience projects
- Overseeing Kenya's drought management policies and programs
- Promoting the integration of drought response into development programs and projects
- Developing a drought early warning system
- Creating contingency plans
- Establishing and reviewing preparedness strategies
- Publishing drought management guidelines
- Conducting research on drought management and climate change
- Advising and giving technical support to drought management institutions
- Coordinating with national government bodies when a drought requires a disaster declaration
- Designing and implementing the country's drought management commitments

- Publishing an annual report on drought management in Kenya

This law also establishes a National Drought Emergency Fund, whose monies are appropriated by the national legislature, to finance the National Drought Management Authority's activities.

2.1.6 National Forest and Landscape Restoration Implementation Action Plan 2022-2026 (FOLAREP)

There are on-going efforts by the national government to meet Kenya's international commitments to environmental protection and mitigation of the impact of climate change. This includes the development of the National Forest and Landscape Restoration Implementation Action Plan 2022-2026 (FOLAREP) which will guide all forest restoration activities in the country. FOLAREP is currently awaiting input from the counties, holding a national review workshop with the County Environment Committees (CECs) and Governors and finally holding a national validation workshop. The importance of the input from the counties is to align the action plan with each of the 47 Counties FLR priorities including synchronizing monitoring and reporting on Forest Landscape Restoration initiatives. This will enable tracking of progress towards the attainment of the Bonn Challenge/AFR 100 of restoring 5.1 Million Ha of forest cover by the year 2030.

2.1.7 National Mangrove Ecosystem Management Plan, 2017-2027

The national mangrove forest management plan is Kenya's guideline for sustainable management of mangrove forests in the country. Prior to the development of this plan in 2017, utilization and management of mangrove resources in Kenya was based on harvesting of wood products and not on other essential roles they play in fishery production, climate change regulation, and shoreline protection. Although this has slowly changed over time, lack of a Plan to guide sustainable management of mangroves has led to deforestation and degradation of mangrove ecosystem; and loss of their essential services. The plan thus sets out to sustain the supply of mangrove goods and services for local and national development.; It provides a road map towards sustainable management of mangrove ecosystem in Kenya for enhanced livelihoods.

2.1.8 Environmental Management and Coordination Act, 1999, Cap. 387

EMCA Cap 387 is the principle law that governs the use, management and regulation of environmental resources in Kenya. Article 49 promotes the use of renewable energy and planting of trees. Article 50 sets out legal framework to ensure the conservation of biological diversity and charges relevant agency to measures the value of unexploited natural resources in terms of watershed, influences on climate, cultural and aesthetic values. Section 56 A of EMCA 1999 (Amended 2015) charges the cabinet secretary to prescribe measures on climate change.

2.1.9 Kenya Vision 2030

The Kenya Vision 2030 is the national long-term development blueprint to create a globally competitive and prosperous nation with a high quality of life by 2030 in a clean and secure environment. It aims to transform Kenya into a newly industrializing middle-income country. The Vision is anchored on the economic, social, and political pillar. Climate change actions were identified in the Second Medium Term Plan (MTP) (2013-2017). The Third Medium Term Plan (2018-2022) recognized climate change as a crosscutting thematic area, and mainstreamed climate change actions in sector plans.

2.1.10 Blue Economy Strategy, 2017

The objective of the Blue Economy (BE) Strategy is to guide the development of an inclusive and sustainable blue economy that becomes a significant contributor to continental transformation and growth. The concept of the BE integrates into a new approach the economic exploitation of the resources of oceans, lakes, rivers and other bodies of water and the conservation of aquatic ecosystems. It promotes the integration of blue carbon and ecosystem services into Climate Change policies and ensure environmentally sustainable and climate resilient coastal communities and economies.

2.2 County Enabling Legal & Policy Framework

2.2.1 Kwale County Sector Plan 2022-2032

The Kwale County Sector Plan seeks to enhance resilience of communities and natural systems to climate change through implementation of the County Climate Change Fund Mechanism. The Sector plan has also mainstreamed climate actions in all the county programs and activities.

2.2.2 Kwale County Spatial Plan 2022 -2032

The County Spatial Plan seeks to transform the livelihoods of the people of Kwale and improve their quality of life by creating employment opportunities, poverty reduction interventions, improvement of environmental conditions, delivery of infrastructure and services, harnessing the full potential of the County resources and good governance. The County Spatial Plan lays emphasis on the vulnerability of the proposed interventions by the impacts of Climate change. The County Spatial Plan recommends commensurate land use planning that is climate resilient.

2.2.3 Kwale County Climate Change Policy 2021

The Kwale County Climate Change Policy is designed to enhance adaptive capacity and strengthen climate resilience of vulnerable groups, including children, women and youth, Persons with Disabilities, the elderly, and other marginalized groups/communities, with a view to contributing to sustainable development. It also provides an avenue for practical response to the 2030 agenda for sustainable development, the Paris Climate Agreement, Kenya Vision 2030, the Big Four Agenda on food security, and Green Economy strategy and Implementation Plan (GESIP) The Policy sets a framework to guide the establishment of a county climate change fund. By putting in place the county climate change fund mechanism, county institutional capacities will be strengthened to access, disburse, absorb, manage, monitor and report on the implementation of climate actions in a transparent and accountable manner. The Policy provides a framework to integrate climate change considerations into county development planning across all sectors, budgeting, and implementation processes, M & E and reporting mechanism; and to guide coordinated and effective implementation of county-level climate actions. The Policy also bring in the issue of M & E, Reporting mechanism. The policy provides a framework to mainstream climate change monitoring, evaluation and reporting mechanism. It seeks to enhance the monitoring and reporting procedures and rules for climate change in Kwale County.

2.2.4 Kwale County Climate Change Act 2022

The Kwale County Climate Change Act, 2022 seeks to provide for the establishment of an appropriate legal and institutional framework for integrating and mainstreaming climate change responses, measures and actions into county development planning and decision making processes, climate change finance mechanisms and for connected purposes.

2.2.5 Kwale County Disaster Risk Management Policy 2022

The Kwale County Disaster Risk Management policy seeks to make a gradual shift from disaster response and recovery to disaster risk prevention and reduction in building resilience and functional natural systems. The policy emphasizes preparedness on the part of the Government, communities and other stakeholders in Disaster Risk Reduction activities. In this regard, the policy aims at the establishment and strengthening of Disaster Risk Management institutions, partnerships, networking and mainstreaming Disaster Risk Reduction in the development process so as to strengthen the resilience of vulnerable groups to cope with potential disasters. The DRM Policy focus on the interlinkages between sustainable county development agenda and disaster risk management. The DRM Policy therefore elaborates intervention measures that can help to achieve the goal of resilient communities and sustainable natural systems for reduced disaster risks and preparedness for response and recovery in Kwale County. The policy provides an institutional framework for coordinated interventions designed to enhance adaptive capacity and strengthen resilience of vulnerable groups with a view to contribute and ensure sustainable development in Kwale County. The institutional framework established by the policy lays emphasis on multi-stakeholder collaboration and multi-hazard approach.

2.3 Relevant Multilateral Environmental Agreements

2.3.1 United Nations Framework Convention on Climate Change (UNFCCC)

The international response to climate change is founded on the UNFCCC that entered into force in 1994. Kenya signed the UNFCCC on 12th June 1992, and ratified the Convention on 30th August 1994. The objective of the conference is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system, in a time frame which allows ecosystems to adapt naturally and enables sustainable development. Kenya is a key player in the global climate change governance system, and participates in meetings of the Conference of the Parties (COP) to the UNFCCC, articulating the national interest, and the country's position, during international negotiations. The National Climate Change Secretariat is the National Focal Point for the UNFCCC. It also works with climate change coordination units in different ministries, departments and agencies to ensure that climate change is mainstreamed in the different sectors of the economy.

2.3.2 Kyoto Protocol

The Kyoto Protocol was adopted on 11th December 1997 and ratified on 16th February 2005. Kenya entered into force on 26th May 2005 and ratified the Paris Agreement on 28th December 2005. The Kyoto Protocol is based on the principles and provisions of the UNFCCC and follows its annex-based. It only binds developed countries, and places a heavier burden on them under the principle of “common but differentiated responsibility and respective capabilities”, because it recognizes that they are largely responsible for the current high levels of GHG emissions in the atmosphere.

2.3.3 Montreal Protocol

The Montreal Protocol on Substances that deplete ozone layer is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. The treaty was adopted in Montreal on 16th September 1987 and entered into force on January 1989. The provisions of the Protocol include control measures, calculation of control levels, control of non-parties and special situation of developing countries.

2.3.4 The United Nations Convention to Combat Desertification (UNCCD)

The UNCCD is the only legal binding framework set up to address desertification and effects of drought. The Convention was established in 1994 to protect and restore our land and ensure a safer, just, and more sustainable future. The Convention is based on the principles of participation, partnership and decentralization.

3 PRIORITY CLIMATE CHANGE ACTIONS FOR 2022-2027

3.1 Introduction

The CCCAP 2022-2027 seeks to reduce the impacts of climate change and increase the resilience of people to cope with the impacts. Adaptation, mitigation and enabling actions have been prioritized in the CCCAP 2022-2027 in seven areas including disaster risk management, food and nutrition security, water and blue economy, forestry, wildlife and tourism, health, sanitation and human settlements, manufacturing, energy and transport. They seek to proactively manage climate change impacts in a way that results in adaptation and sustainable development.

3.2 Priority climate change actions

The priority actions focused on seven areas including; disaster risk (floods and drought) management, food nutrition security, water and blue economy, forestry, wildlife and tourism, health, sanitation and human settlements, manufacturing and energy and transport as discussed below.

3.2.1 Disaster Risk (floods and drought) Management

Kwale, like the rest of Kenya, is bearing the brunt of anthropogenic induced climate change related disasters and associated environmental and economic losses. Climate change in Kwale manifests itself in rapid-onset events, such as frequent flooding; and slow-onset ones, such as rising temperatures, recurrent droughts and desertification. Proactive response measures are required in order to address the above climate change related disasters.

The County has experienced extreme drought conditions and related crop failure in the past. In 2013, the county experienced low rainfall during the long rains (March to May) which resulted in maize and rice harvests at just 14% and household food stocks at 22% compared to the five-year average. In 2021, approximately half of the total County population faced hunger due to lack of rain.

Floods are common in Lunga-lunga, and Jego areas and along rivers Umba, and Ramisi caused by impeded drainage that led to displacement of people, damage of properties, and diversion of River Umba. Heavy rainfall in December 2021 led to flooding that rendered some roads impassable for instance roads in the Shimba Hills area which resulted to high cost of transport, delay in movement of commodities, and post-harvest losses. In the past year, when rains did come, the River Umba burst its banks destroying more than 25,000 acres of land, displacing as many as 34,219 people, and creating major health concerns regarding water-borne illnesses for humans and livestock.

The magnitude and severity of these climate related disasters makes the identification of impending climate risks an urgent matter; likewise, considering how practices that help citizens become more resilient in the face of imminent threats to their health, safety, and livelihoods becomes an exercise with the potential to affect hundreds of thousands of lives.

The priority actions in the CCCAP 2022-2027 focus on reducing climate related disasters and increasing the resilience of people to cope with impacts of climate change. They seek to proactively manage climate-related disasters in a way that results in adaptation and sustainable development.

These include; establishment of drought and flood early warning systems, availing climate finance, establishing disaster management committees in the village units, identifying and mapping areas at risk of flooding, identifying potential resettlement areas for communities at risk of flooding, protection of water catchment and riparian areas, building the capacity of WRUAs through training and promoting construction of climate proofed infrastructures.

3.2.2 Food and nutrition security

One of the national Big Four Agenda is food security and climate change has the potential to hinder the achievement of this pillar. Agriculture, including crop and animal husbandry; livestock sale yards; County abattoirs and fisheries; is the main economic activity in Kwale County and plays a vital role in ensuring food and nutrition security, improved rural livelihoods and poverty alleviations. The agriculture sector is highly susceptible to climate shocks such as extreme climate events, changes in precipitation and temperature rises.

Unpredictable rain patterns and decline in rainfall result in crop failure, pasture deterioration, poor livestock body conditions, and reduced milk production. The increase in temperature is likely to increase the prevalence of crop pests and diseases, which often negatively affect crop yields. This may also affect fodder for livestock, thereby reducing productivity. The increase in outbreaks of livestock diseases and pastoralists' movement also exacerbates conflicts.

The CCCAP 2022-2027 proposes concrete actions to enhance food security in Kwale County including; promoting climate smart agriculture, establishment of efficient irrigation systems, sensitizing farmers to plant drought resistant crops/fodder, rearing of high quality livestock breeds that can withstand harsh climatic conditions, adoption of Integrated Pest Management (IPM) control approach and capacity building of farm pest management, provision of agricultural extension services and certified seeds to farmers, capacity building on crop diversification, subsidization of farm inputs and promoting agroforestry.

3.2.3 Water and the Blue Economy

Water forms one of the basic natural resource for sustainable development and human wellbeing. The main water resources in Kwale County comprise of rivers, shallow wells, springs, water pans, dams, rock catchments, and boreholes. However, most of the rivers are seasonal thus cannot be relied upon to supply the much-needed water in the County for both agriculture and domestic uses. Changes in rainfall and frequent prolonged drought have aggravated water situation in Kwale County. Many rivers have dried up due to the prolonged droughts. Flash floods and widespread runoffs increase the risk of contamination that reduces quality of available waters and damages water infrastructures. Increased extraction lowers groundwater levels and leads to salt water intrusions.

Fishing is one of the principal sources of livelihood within the county, with 31% of people engaged in fishing as their main source of livelihood. Change in marine temperature causes bleaching of corals, which also lowers associated reef biodiversity. Coral bleaching has previously been reported by the residents of Pongwe-Kikoneni Ward and is as a result of increased temperatures over the years. Decrease in pH due to increased levels of dissolved carbon dioxide affects the skeleton-building ability of corals and shell fish (calcification), which reduces tourism and fish productivity.

Rise in sea level increases salinity upstream thus lowering agricultural potential. In addition, it has resulted to loss of mangroves, coastal flooding and loss of certain fish species.

The CCCAP 2022-2027 seeks to increase water availability and promote the blue economy sector. The proposed priority actions include; protection of water catchment areas, building capacity of WRUAs, promoting rainwater harvesting, construction of additional water pans and dams, desilting of rivers/water pans/dams, renovation of the non-functional boreholes and water kiosks and extension of water pipelines. In addition, protection and restoration of coral reefs and degraded mangrove ecosystem is aimed at improving the blue economy.

3.2.4 Forestry, Wildlife and Tourism

Kwale County has a tree cover of about 14% (115,108.09 ha) and a forest cover of 5.52% (45,416 ha) (National Forest Assessment Report,2021). The forest cover falls below the recommended forest global threshold and constitutional requirement of 10% forest cover of the total land area of 827,020 ha. Majority of the forest cover is found within the Shimba Hills Ecosystem, Buda forest and the 26 Kayas spread across the county comprising of indigenous tree species. Alongside the terrestrial forest cover, Kwale County is also endowed with a vast area of mangrove forests measuring 8,350 ha accounting for 14% of the total cover in Kenya.

The natural forests are important to the local communities in the county as are a source of high-quality building and construction poles, sawn timber and fuel wood. Non-timber forest products include honey and medicinal herbs. Besides the socio-economic importance, the forest provides environmental services i.e. river catchment for the south coast area, soil and water conservation. The Shimba Hills Ecosystem is particularly a rich biodiversity area comprising of Shimba Hills National Reserve, Mkongani North and West Forest Reserves, Mwaluganje Elephant Sanctuary and the Mwaluganje Forest. It is an important habitat for more than 53 species of both large and small mammals, 164 species of invertebrates, 50 species of reptiles and amphibians, 620 species of plants and 112 species of birds (Omar et al., 2014).

Mangrove forests are habitat for a variety of terrestrial and aquatic animals. The terrestrial fauna includes many species of birds, reptiles, mammals and insects. The aquatic fauna includes prawns, crabs and molluscs.

Deforestation and forest degradation brought about by unsustainable utilization of forest products, including timber harvesting, charcoal production, and grazing in forest are the major challenges facing the forest sector. The negative impacts of deforestation, such as soil erosion and increased flooding, are exacerbated by climate change.

Shifts in rainfall, reduced water sources, decreased forage areas, intense droughts impact food resources and habitats. These impacts increase wildlife movement into human settlements increasing cases of human-wildlife conflict that are leading to a decline in wildlife population or even to the extinction of endemic species. Subsequently, this impacts the tourism sector.

The CCCAP 2022-2027 seeks to increase the forest cover and prevent deforestation and forest degradation through; Promoting the use of green energy such as solar, biogas and energy saving cooking stoves across the county to reduce overreliance on wood fuel, providing alternative sources of livelihoods to reduce overreliance on forest products, promoting carbon trading schemes

and building the capacity of tree farmers in the county to enroll in carbon programmes to enhance income and livelihoods from forestry value chains, strengthening the capacity of Charcoal Producers Associations (CPAs) to enhance implementation of the Forest Rules, 2010 and introducing integrated community forest management strategies.

In order to conserve the wildlife and reduce human-wildlife conflicts, the CCCAP 2022-2027 proposes the following priority actions; installation and maintenance of the electric fence and Wildlife barriers in the Human-Wildlife Conflict-prone areas, sensitizing communities on wildlife benefits, establishing adequate water points in wildlife parks and reserves, convert Ranches to wildlife conservancies to enhance wildlife conservation and corridors in consultation with local communities and private owners and processing and submitting claims for compensation of human-wildlife conflict victims.

3.2.5 Health, sanitation and human settlements

Sanitation and sustainable human settlements are critical to human health. Basic sanitation is defined as having access to facilities for the safe disposal of human waste, as well as having the ability to maintain hygienic conditions, through services such as garbage collection, industrial/hazardous waste management, and wastewater treatment and disposal.

Climate change is already impacting health in a myriad of ways, including death and illness from increasingly frequent extreme weather events, such as heatwaves and floods. Rising temperatures provide an environment conducive for malaria vectors to thrive. As a result, the health facilities are confronted with additional burden. Kwale County is experiencing increased incidences of malaria infections due to the impacts of climate change. Floods on the other hand cause injuries and drownings and spread waterborne disease. Floods in the county are common in Lunga-lunga, and Jego areas and along rivers Uмба and Ramisi caused by impeded drainage. In the past year, when rains did come, the River Uмба burst its banks destroying more than 25,000 acres of land, displacing as many as 34,219 people, and creating major health concerns regarding water-borne illnesses for humans and livestock.

Human settlements in the county range from large urban areas to small villages in the rural areas. However, these human settlements are faced with challenges which manifest through overcrowding, water shortage and poor sanitation, pollution, traffic congestion, crime amongst others as a result of inadequate infrastructure and services to match the growing population. These built up environments increases risks of flooding, heat waves and other climate hazards.

The county generates solid and liquid wastes which are management through various systems. Solid wastes are collected and disposed of at open dumpsites. Land-based pollution to the marine environment is a major challenge in the county. Liquid waste management in the County comprises of onsite treatment through septic tanks and soak pit systems mainly in the urban areas and pit latrines. Improper solid waste management can result into clogging of drainage systems resulting into flooding.

The CCCAP 2022-2027 proposes an integrated approach to climate actions that addresses sustainable human settlements and health, and sanitation services. These include; awareness creation on emergency of new diseases, vaccination/immunization campaigns, equipping health facilities with adequate infrastructure and drugs and provision of mosquito nets and disease preventive medication.

In order to improve basic sanitation in the county, the CCCAP 2022-2027 proposes the following priority actions; construction of sewage infrastructure in urban and peri-urban areas, investments in adequate solid waste management infrastructure and enhancing enforcement mechanism for solid waste management. Sustainable human settlements will be achieved through the implementation of the county spatial plan, development and implementation of a Land Use Plan for the county, building climate resilient urban areas by incorporating green spaces, sustainable drainage systems and water sensitive urban designs to reduce the impacts of urban floods.

3.2.6 Manufacturing

The county has a number manufacturing industries/factories with activities centered upon agro-processing, mining, cottage industries, manufacturing, industrial processing and urban based industries. While manufacturing sector often increases pollution through emission of greenhouse gases, it is also vulnerable to climate change. The sector depends largely on water, energy and raw materials which are negatively impacted by climate change. An example is titanium mining in the county which is reliant on land and water access, two resources that are becoming scarce in the County. Sea level rise and flash floods can flood mining tunnels and damage transport infrastructures, while a reduced supply of water and conflicts over water use, may negatively affect manufacturing operations.

The CCCAP 2022-2027 proposes actions to promote cleaner production through reducing emissions from industrial processes, reducing reliance on fossil fuels and promoting use of green energy.

3.2.7 Energy and transport

Energy resources and transport are a factor to sustainable development. The use and production of energy have a massive impact on the climate and the converse is also increasingly true. Climate change directly affects fuel supply, energy production as well as the physical resilience of current and future energy infrastructure. Heatwaves and droughts are already putting existing energy generation under stress, making it even more important to reduce fossil fuel emissions. A transition to renewable energy will help alleviate growing water stresses. On the other hand, heavy rains may result in flooding, which could disrupt traffic, delay construction activities, and weaken or wash out the soil and culverts that support roads, tunnels, and bridges. Flooding shortens life expectancy of energy and road infrastructure.

The CCCAP 2022-2027 seeks to reduce greenhouse gas emissions from the energy and transport sectors in order to mitigate the impacts of climate change. The proposed actions are; investments in climate proofed energy and transport infrastructure, implementation of the Energy Policy and Act, 2019, development and implementation a County Energy Plan, implementation of the Kenya Off-Grid Solar Access Project (KOSAP, promoting investments in green energy such as solar, wind and biogas, partnerships with national government, NGOs and private sector to invest in large scale clean energy and establishing community briquettes making schemes at ward level and promote use of energy efficient cooking stoves.

3.3 Adaptation

Drought	Floods	Environmental degradation	Increased temperatures	Sea level rise	Coral bleaching	Infrastructure
<ul style="list-style-type: none"> • Establishment of early warning systems • Availing climate finance for priority climate action • Protection of water catchment areas • Establishing a disaster management committees 	<ul style="list-style-type: none"> • Establishment of early warning systems • Identifying and mapping areas at risk of flooding • Promoting construction of climate proofed infrastructures • Construction of sustainable drainage system • Protection of riparian areas • Protection of water catchment areas • Identification of resettlement areas for communities in flood risk areas 	<ul style="list-style-type: none"> • Promoting afforestation • Sensitizing communities on benefits of protecting and conserving forests • Promoting the use of green energy • Construction of gabions and terraces • Promoting climate smart agriculture • Promoting agroforestry and sustainable farming methods • Protection of Kayas 	<ul style="list-style-type: none"> • Medical/veterinary/pest control services • Promoting cleaner production technologies • Promoting afforestation 	<ul style="list-style-type: none"> • Identifying and mapping areas at risk of flooding • Constructing eco-friendly sea walls • Resettlement of affected persons • Establishment of early warning systems • Implementation of the Shoreline Management Strategy for Kenya, 2010 	<ul style="list-style-type: none"> • Enhancing coral reefs restoration 	<ul style="list-style-type: none"> • Constructing climate proofed infrastructure

County Climate Change Action Plan (2022-2027)

Food and nutrition security	Water	Fisheries/Blue Economy	Health	Forestry
<ul style="list-style-type: none"> • Promoting Climate smart agriculture • Promoting efficient irrigation systems • Sensitizing farmers to plant drought resistant fodder/crops • Sensitizing farmers to keep drought resistant breeds • Capacity building on sustainable farming methods • Adoption of IPM control approach • Capacity building of farm pest management • Provision of agricultural extension services • Provision of certified seeds to farmers • Capacity building on crop diversification • Subsidization of farm inputs • Promoting agroforestry 	<ul style="list-style-type: none"> • Protection of water catchment areas • Building the capacity of WRUAs through training • Promoting rainwater harvesting • Construction of additional water pans and dams • Desilting of rivers/water pans/dams • Renovation of the non-functional boreholes and water kiosks • Extension of water pipelines 	<ul style="list-style-type: none"> • Protection and restoration of coral reefs • Restoration of degraded mangrove areas • Promoting aquaculture 	<ul style="list-style-type: none"> • Awareness creation on emergence of new diseases • Vaccination/immunization campaigns • Financial/material support • Equipping of health facilities with adequate infrastructure and drugs Uptake and utilization of treatment services • Provision of mosquito nets and disease preventive medication 	<ul style="list-style-type: none"> • Promote the use of green energy • Provide alternative sources of livelihoods to reduce overreliance on forest products • Strengthen the capacity of Charcoal Producers Associations • Promote carbon trading schemes • Build the capacity of tree farmers in the county to enroll in carbon programmes • Introduce integrated community forest management strategies

3.4 Mitigation

Manufacturing	Energy	Transport	Waste management
<ul style="list-style-type: none"> Promoting cleaner production technologies Reducing reliance on fossil fuels Promoting use of green energy 	<ul style="list-style-type: none"> Investments in climate proofed energy infrastructure Implementation of the Energy Policy and Act, 2019 Development and implementation a County Energy Plan Implementation of the Kenya Off-Grid Solar Access Project Promoting investments in green energy Partnerships with national government, NGOs and private sector to invest in large scale clean energy Establishing community briquettes making schemes at ward level 	<ul style="list-style-type: none"> Investments in climate proofed energy and transport infrastructure 	<ul style="list-style-type: none"> Construct sewage infrastructure in urban and peri-urban areas Invest in adequate solid waste management infrastructure Enhance enforcement mechanism for solid waste management

3.5 Enabling

Education	Disaster management	Human settlements	Human-wildlife conflicts	Human conflicts
<ul style="list-style-type: none"> Awareness creation, resilience and adaptive capacity to disasters 	<ul style="list-style-type: none"> Availing climate finance for priority climate action Establishment of early warning systems 	<ul style="list-style-type: none"> Implementation of the county spatial plan Develop and implement a County Land Use Plan Building climate resilient urban areas Constructing sustainable drainage systems and water sensitive urban designs 	<ul style="list-style-type: none"> Fencing of national parks and game reserves Sensitizing communities on wildlife benefits Establishment of adequate water points in wildlife parks and reserves Conversion of Ranches to wildlife conservancies Compensation for affected persons 	<ul style="list-style-type: none"> Identify and map potential farmers/pastoralists conflict areas Enforcement of laws Setting up of police posts Community arbitrators

4 DELIVERING COUNTY CLIMATE CHANGE ACTION PLAN 2022-2027

4.1 Enablers

These are the factors that make it easier to plan and implement adaptation and mitigation actions. A range of actions are required to ensure effective delivery of adaptation and mitigation actions identified in the seven priority areas described in the previous chapter. These include;

- Enabling policy and regulatory framework
- Capacity building;
- Resource mobilization;
- Coordination of CCAP implementation

4.1.1 Enabling policy and regulatory framework

Adaptation of climate change in the county needs to be supported by an enabling policy and regulatory framework. This involves development of appropriate legislations including climate fund regulations to guide utilization of the funds as well address the climate change issues in the county.

4.1.2 Technology and innovation

Technology and innovation has been recognized as one of the essential enabling elements for adapting to climate change. Digital technologies can contribute to enhancing adaptive capacity to climate change by supporting the flow of useful and locally contextualized climate information as well as the communication between stakeholders in responding to climate impacts. Adoption of green technologies such as alternative technologies to fossil fuels, creating an enabling environment for the private sector, Non-Governmental Organizations (NGOs) and Community Based Organizations (CBOs) among others to develop and disseminate adaptation and mitigation technologies to deliver the associated priority climate change actions.

4.1.3 Capacity building

It is recognized that the county government has considerable technical capacities in various disciplines among its departments. In addition, there are capacities among key national institutions, state corporations, private sector, research and learning institutions which could potentially be utilised in implementation of the CCAP. However, the Environmental Performance Index (EPI) of the county indicated inadequate capacity in climate change expertise. The county will therefore need to build the technical capacity for implementation of the CCAP through recruitment of qualified officers and training the existing personnel in environment and conservation of natural resources. This will be achieved through short course training; refresher courses; seminars and exchange visits among others. It is expected that implementation of the CCAP may also seek technical support from national research and development partners.

Alongside the internal capacity building, the county government should enhance awareness among the different stakeholders including local communities, NGOs and the private sector on their roles in the implementation of the CCAP. The county can potentially influence targeted capacity building of local communities such as BMUs, CFAs and WRUAs by NGOs and development partners to create enabling conditions for the implementation of the CCAP.

4.1.4 Resource mobilisation

Effective implementation of the CCAP requires allocation of adequate human as well as financial resources for both recurrent and capital expenditure. The estimated budget for implementing the Plan over the next 5 years is estimated at KES 11 Billion.

The main sources of finance will come from the county government as well as consolidated funds from the key national government institutions involved in the implementation of the action plan, including:

- i) Government sources:
 - a) County Government funds appropriated by the County government for environment and natural resources management
 - b) Funds appropriated to the national institutions for coastal zone conservation and management; including NEMA, KeFS, KWS, KFS, CDA, KCGS,
 - c) Revenue generated from licenses, levies and royalties and leases
 - d) County Climate Change Fund (CCCF) which is a mechanism through which counties can create, access and use climate finance to build their resilience and reduce vulnerabilities to a changing climate in a more coordinated way. The CCCF is a public fund designed primarily to finance local adaptation. In this respect, majority, currently 70% of the CCCF is earmarked to finance ward-level investments, 20% for county-level investments and 10% assigned for the running costs.
- ii) Public Private Partnerships: Funds from PPPs with the county, and national governments on investments from the private sector in the blue economy
- iii) External sources: Funds from development partners and other agencies such as World Bank, European Union and the African Development Bank (ADB) among others.

4.1.5 Coordination of CCAP implementation

The preparation of the CCAP was a participatory stakeholder driven process involving various stakeholders involved in environmental management. As such, its implementation will be a collective responsibility of all the stakeholders including national government agencies, Kwale county government departments, Universities, Non-State Actors (NGOs, Private sector, CBOs, general public and development partners). Development of partnerships amongst these stakeholders as well as cultivation of good political will through engagement of leaders at both national and county level is important for the successful implementation of the county climate change action plan.

In light of its mandate under Section 19 of the National Climate Change Act, 2016, the County Government in collaboration with the County Climate Change Planning Committee will take a lead role in implementation of the action plan including stakeholder engagement and coordination.

The Directorate through the Climate change Unit will spearhead the day to day management of the implementation of the plan.

The Ward Climate Change Planning Committee will also be instrumental in grassroots mobilization and coordination of the implementation of public good investments prioritised by communities.

The engagement of stakeholders in the implementation process will be guided by their statutory mandate and capacity. This will be done in accordance with the implementation framework approved during the review and validation of the CCAP by the stakeholders. The county will further explore opportunities for collaboration with the Private Sector through the national government pursuant to the Public Private Partnership (PPP) Act, 2021. The Act provides for the participation of the private sector in the financing, construction, development, operation and maintenance of infrastructure projects of the government.

4.2 Implementation matrix

4.3 Introduction

The success of the County Climate Change Action Plan lies in its implementation through actualizing the adaptation and mitigation actions identified in the seven priority areas. To ensure effective implementation, the county government will need to mobilize adequate resources, strengthen departmental capacities and synergies between the county and national government institutions and non-state actors, mainstream the CCAP into sectoral plans and scale up key stakeholder involvement. The plan will be implemented over a period of 5 years (2022 – 2027) through Annual Work Plans (AWP) and with support from other sectoral plans as well as development and implementation of a new County Integrated Development Plan (CIDP 2022-2027).

4.4 Implementation plan

The Implementation framework for the CCAP is presented in Table 8. The matrix has outlined the key activities to be implemented under each of the climate change hazards. The matrix has also highlighted the activities' expected outputs/outcomes, lead institutions, timeframe and budget. Table 8 provides the CCAP's performance/monitoring and evaluation indicators and actors. The Plan Implementation Matrix will be a critical and important tool for:

- i) Informing the development of project concepts and proposals
- ii) Mobilizing, allocating and utilizing resources during plan implementation;
- iii) Efficiently and effective management and coordination of plan implementation process;
- iv) Soliciting collaboration and support from partners and all other stakeholders in the coastal zone;
- v) Monitoring progress, evaluating results/outputs and assessing outcome/impact, documentation and dissemination of results of impact;
- vi) Facilitating mid-term and end-of-plan reviews/evaluations

4.5 Risks, uncertainties and sustainability

There are potential risks that may affect implementation of the CCAP. The main risks are:

- Inadequate financial resources: County government development priorities may change depending on the prevailing economic conditions and as such, may not be able to allocate adequate resources for implementation of the CCAP due to prioritization of development projects.
- Inadequate capacity: Limitations in the capacity of county government departments may result in poor or lack of implementation of some activities in the management plan especially those activities which require highly specialized skills and technical inputs
- Inadequate coordination and cooperation: County government development projects and programmes may not mainstream environmental considerations as envisaged in the CCAP.
- Inadequate awareness: Failure to sustain the stakeholder buy-in and support cultivated during the plan development process may affect the CCAP implementation phase. This does not only apply to government agencies/departments but also NGOs; private sector; CBOs and the local communities
- Inadequate political good will: The county governments may not adequately facilitate their officers to implement the activities enumerated in the action plan. Improper delegation of responsibilities and failure to involve competent partners may also affect implementation of the plan

- Extreme Natural Disasters related to climate change: Extreme floods and droughts may affect / disrupt action plan implementation programmes e.g., control of soil erosion, biodiversity / habitat rehabilitation.

The implementation framework has provided mechanisms to mitigate the above-mentioned risks and uncertainties. These includes ensuring involvement of all relevant stakeholders in implementation of the action plan; investing in capacity building where necessary; mobilization and allocation of adequate resources to activities; coordination and building of partnerships and linkages for technical and financial support. Implementation of the Action Plan is based on a number of key assumptions including timely support and interventions from the county and national government institutions, availability of resources and an enabling environment.

County Climate Change Action Plan (2022-2027)

Table 3: Implementation Matrix for CCCAP 2022-2027.

Strategic objective	Priority actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible institutions	Targeted Groups	Timeframe	Budget
Disaster (drought and floods) management							
Drought	Establishment of early warning systems	Effective early warning systems established	No. of early warning systems established	NDMA/CGK/ KMD	Communities, women and children in drought prone areas	2022-2027	25M
	Availing climate finance for priority climate action	Climate finance secured	No. of Locally Led Climate Action programmes financed	National Treasury/ CGK	Communities in the entire county	2022-2027	1000M
	Protection of water catchment areas	Protected catchment areas Enhanced water resources potential	No. of protected catchment areas	CGK/WRA/ WRUAs/KWTA/ KFS/Private entities/NGOs/ CBOs/ MoALF/ Conservation Groups	Farmers, WRUAs and Conservation Groups	2022-2027	200M
	Establishing a disaster management committees	Established disaster management committee	No. of disaster committee established	NDMA/CGK/ KMD	Communities living in flood and drought prone areas	2022-2027	15M
Floods	Establishment of early warning systems	Established early warning systems	No. of early warning systems established	NDMA/CGK/ KMD	Communities living in flood prone areas and areas experiencing flash floods	2022-2027	15M
	Identify and map areas at risk of flooding	Maps of the areas at risk of flooding	No. of maps produced	NDMA/CGK/ KMD		2022-2027	10M
	Identification of resettlement areas for communities in flood risk areas	Communities in flood prone areas resettled	No. of households in flood prone areas resettled	NDMA/CGK/ KMD	Communities living in flood prone areas	2022-2027	100M

County Climate Change Action Plan (2022-2027)

	Promoting construction of climate proofed infrastructures	Constructed climate proofed infrastructure	No. of climate proofed infrastructure constructed	NCA/NEMA/NHC/CGK/	Landlords, tenants, industries, private sector investors	2022-2027	500M
	Construction of sustainable drainage system	Constructed drainage system	No. of drainage system constructed	NCA/CGK		2022-2027	150M
	Building the capacity of WRUAs through training	Trained WRUAs	No. of WRUAs participating in training session	NEMA/WRA/CGK/KFS	WRUAs	2022-2027	30M
	Protection of riparian areas	Protected riparian area	Area of riparian land protected	NEMA/WRA/WRUAs/CGK	Farmers, WRUAs, Conservation Groups	2022-2027	100M
	Protection of water catchment areas	Conserved water catchment areas	Area of conserved catchment areas	CGK/WRA/WRUAs/KWTA/KFS/Private entities/NGOs/CBOs/ MoALF/ Conservation Groups	Farmers, WRUAs, Conservation Groups	2022-2027	200M
Food and nutrition security							
Food and nutrition security	Promoting climate smart agriculture	Farmers adopting climate smart agriculture	No. of farmers practicing climate smart agriculture	MoALF/CGK/KARLO/ICIPE NGOS/CBOS/Private sector	Farmers	2022-2027	150M
	Promoting efficient irrigation systems	More land under irrigation	No. of hectares under irrigation	MoALF/CGK/KARLO/NGOs/Private Sector	Farmers	2022-2027	35M
	Sensitizing farmers to plant drought resistant fodder/crops	More farmers growing drought resistant fodder/crops	No. of farmers growing drought resistant crops	MoALF/CGK/KARLO/ICIPE NGOS/CBOS/Private sector	Farmers	2022-2027	5M

County Climate Change Action Plan (2022-2027)

	Sensitizing farmers to keep drought resistant breeds	More farmers keeping drought resistant breeds	No. of farmers keeping drought resistant breeds			2022-2027	5M
	Capacity building on sustainable farming methods	Farmers practicing sustainable farming methods	No. of farmers practicing sustainable farming methods	MoALF/CGK/ KARLO/NGOS/ CBOS/Private sector		2022-2027	5M
	Adoption of Integrated Pest Management (IPM) control approach and capacity building of farm pest management	More farmers adopting IPM control approach and pest management	No. of farmers trained on IPM and pest management			2022-2027	20M
	Provision of agricultural extension services	Extension services provided	No. of farmers trained	MoALF/CGK/ KARLO/NGOS/ CBOS/Private sector	Farmers	2022-2027	50M
	Provision of certified seeds to farmers	Certified seeds supplied to farmers	No. of farmers supplied with certified seeds	MoALF/CGK/	Farmers	2022-2027	300M
	Capacity building on crop diversification	Farmers growing new variety of crops	No. of farmers growing new variety of crops	MoALF/CGK/ KARLO/NGOS/ CBOS/Private sector	Farmers	2022-2027	5M
	Subsidization of farm inputs	Increased use of farm inputs	No. of farmers using farm inputs	MoALF/CGK	Farmers	2022-2027	20M
	Promoting agroforestry	More farmers practicing agroforestry	No. of farmers practicing agroforestry	MoALF/CGK/ KARLO/NGOS/ CBOS/Private sector	Farmers/CFAs	2022-2027	300M
Water and blue economy							
Water	Protection of water catchment areas	Protected water catchment areas	No. of water catchment areas protected	CGK/WRA/ WRUAs/KWTA/ KFS/Private entities/NGOs/	Farmers, WRUAs and Conservation Groups	2022-2027	200M

County Climate Change Action Plan (2022-2027)

				CBOs/ MoALF/ Conservation Groups			
	Building the capacity of WRUAs through training	Trained WRUAs	No. of WRUAs participating in training session	NEMA/WRA/CGK/ KFS	WRUAs	2022-2027	30M
	Promoting rainwater harvesting	Adoption of rainwater harvesting by the local communities	No. of households that have adopted rainwater harvesting	CGK/WRA/ CWSB/WRUAs/ NGOs/	Farmers, Household consumers, Institutions and Industrial consumers	2022-2027	100M
	Construction of additional water pans and dams	Constructed water pans and dams	No. of water pans and dams constructed	WRA/NCA/NEMA/ CGK/NGOs/CBOs/ Private sector	Farmers, Household consumers, Institutions and Industrial consumers	2022-2027	2000M
	Desilting of rivers/water pans/dams	Desilted rivers/water pans/dams	No. of desilted rivers/water pans/dams	WRA/NCA/NEMA/ CGK/NGOs/CBOs/ Private sector	Farmers, Household consumers, Institutions and Industrial consumers	2022-2027	150M
	Renovation of the non-functional boreholes and water kiosks	Renovated non- functional boreholes and water kiosks	No. of renovated non-functional boreholes and water kiosks	WRA/NCA/NEMA/ CGK/NGOs/CBOs/ Private sector	Institutions and Industrial consumers	2022-2027	150M
	Extension of water pipelines	Extended water pipelines	Length of the extended water pipelines	NWCPC/NCA/NHC /NEMA/CGK/ Private Sector		2022-2027	300M
Blue economy	Protection and restoration of coral reefs	Restored coral reefs	Area of the restored coral reefs	CGK/KWS/ KEMFRI/KeFS/ CBOs/NGOs/ KEMFSED	Fisher communities, fish farmers, CBOs/ Conservation Groups/NGOs	2022-2027	20M
	Restoration of degraded mangrove areas	Restored mangrove ecosystem	Area of the restored mangrove ecosystem	ENRM/KWS/ KFS/ NEMA/KeFS/ KEFRI/KEMFRI/	Fisher communities, CBOs/	2022-2027	20M

County Climate Change Action Plan (2022-2027)

				CGK/ BMUs/CFAs NGOs	Conservation Groups/NGOs		
	Promoting aquaculture	Increased fish production	Amount of fish produced	KEMRI/CGK/KeFS/ CGK/BMUs	Fisher communities	2022-2027	20M
Forestry, Wildlife and Tourism							
Forestry	Promote the use of green energy such as solar, biogas and energy saving cooking stoves Promote afforestation	Increased use of green energy by the local communities	No. of households using green energy	KEFRI/KFS/KWS/ CGK/CBOs/NGOs/P rivate Sector	Farmers/ Women Groups	2022-2027	50M
	Provide alternative sources of livelihoods to reduce overreliance on forest products	New and adopted livelihoods	No. of households that have adopted new livelihoods	KEFRI/KFS/KWS/ CGK/CBOs/NGOs/P rivate Sector	Communities in the entire county	2022-2027	100M
	Strengthen the capacity of Charcoal Producers Associations (CPAs) to enhance implementation of the Forest Rules, 2010	Reduced charcoal burning	No. of CPAs participating in the training	KEFRI/KFS/CGK/ CBOs/NGOs/ Private Sector	Charcoal Producers Associations	2022-2027	20M
	Promote carbon trading schemes and build the capacity of tree farmers in the county to enroll in carbon programmes	More farmers participating in carbon programmes	No. of farmers participating in carbon programmes	KEFRI/KEMFRI/KFS /CGK/CBOs/NGOs	Farmers/ Conservation Groups/CBOs	2022-2027	20M
	Introduce integrated community forest management strategies	Increased tree cover	No. of forest management strategies implemented	KEFRI/KEMFRI/KFS /CGK	Farmers/ Conservation Groups/CBOs	2022-2027	30M

County Climate Change Action Plan (2022-2027)

Wildlife	Install and maintain the electric fence and Wildlife barriers in the Human-Wildlife Conflict-prone areas	Reduced cases of human-wildlife conflicts	Area of installed electric fence	CGK/KWS/KFS/WRTI/CWCC	Communities living in human-wildlife conflict prone areas	2022-2027	500M
	Sensitize communities on wildlife benefits	Reduced cases of illegal wildlife poaching		CGK/KWS/KFS/WRTI/CWCC		2022-2027	50M
	Establish adequate water points in wildlife parks and reserves	Established water points in parks and reserves	No. of water points established in parks and reserves	CGK/KWS/KFS/WRTI/CWCC	Wildlife parks and reserves	2022-2027	200M
	Convert Ranches to wildlife conservancies to enhance wildlife conservation and corridors in consultation with local communities and private owners	Wildlife corridors established Ranches transformed to conservancies	No. of wildlife conservancies established No. of ranches converted into conservancies	CGK/KWS/KFS/WRTI/Ranchers/NGAO/National Land Commission	Ranchers/Farmers/Private conservancies	2022-2027	500M
	Process and submit claims for compensation of human-wildlife conflict victims	Compensation of human-wildlife conflict claims	No. of victims affected by human wildlife conflicts compensated	CGK/KWS/KFS/WRTI/CWCC	Communities living in human-wildlife conflict prone areas	2022-2027	1200M
Tourism	Construction of eco-friendly seawalls	Constructed eco-friendly seawalls	No. of eco-friendly seawalls constructed	NEMA/KMFRI/CGK/KeFS/Private Sector	BMUs/Fisher communities/Private Establishments	2022-2027	50M
	Implement the Shoreline Management Strategy for Kenya, 2010	Implemented recommendations of the Shoreline Management Strategy for Kenya, 2010	No. of recommended measures implemented	CGK/NEMA/KWS/KEMFRI/KeFS/CBOs/NGOs	BMUs/Fisher communities/Private Establishments	2022-2027	100M

County Climate Change Action Plan (2022-2027)

Health, Sanitation and Human Settlements							
Health	Create awareness on emergence of new diseases	Reduced cases of infections	No. of households accessing information	KEMRI/Ministry of Health/CGK	Households/Institutions	2022-2027	10M
	Vaccination/immunization campaigns	Reduced cases of infections	No. of persons vaccinated/immunized	KEMRI/Ministry of Health/CGK	Households/Institutions	2022-2027	20M
	Identify and provide assistance either financial, material support to vulnerable members of the community	More vulnerable members of the community getting financial and material support	Amount of money disbursed No. of household beneficiaries	Ministry of Health/CGK/Private Sector/NGOs	Vulnerable members of community including women, children	2022-2027	100M
	Equipping health facilities with adequate infrastructure and drugs	Health facilities equipped with adequate infrastructure and drugs	No. of health facilities equipped with adequate infrastructure and drugs	Ministry of Health/CGK/NGOs	Health facilities	2022-2027	200M
	Provision of mosquito nets and disease preventive medication	Reduced cases of malaria	No. of persons supplied with mosquito nets and preventive medication	Ministry of Health/CGK/NGOs	Communities in the entire county	2022-2027	10M
Sanitation	Construct sewage infrastructure in urban and peri-urban areas	Improved management of sewage generated in the county	No. of sewage management infrastructure constructed	CGK/NEMA	Households/institutions/industries	2022-2027	500M
	Invest in adequate solid waste management infrastructure in the municipalities and market centres	Improved solid waste management	No. of solid waste management infrastructure provided	NEMA/CGK/Private Sector/NGOs/CBOs	Households/institutions/industries/market centres/Private Sector	2022-2027	200M

County Climate Change Action Plan (2022-2027)

	Enhance enforcement mechanism for solid waste management	Improved solid waste management	Enforcement mechanism put in place	NEMA/CGK/Private Sector/NGOs/CBOs	Households/institutions/industries/market centres/Private Sector	2022-2027	50M
Human settlements	Implement the county spatial plan	Planned settlement patterns	No. of recommendations from the county spatial plan implemented	CGK/ Ministry of Lands and Physical Planning	Urban areas/institutions/ Industries /Households	2022-2027	100M
	Develop and implement a County Land Use Plan	Planned settlement patterns	No. of recommendations from the county Land Use Plan implemented	CGK/ Ministry of Lands and Physical Planning	Urban areas/institutions/ Industries /Households	2022-2027	100M
	Building climate resilient urban areas	Green spaces incorporated in urban areas	Area covered by green spaces	NCA/CGK/Private Sector/NGOs	Communities living in urban areas	2022-2027	200M
	Constructing sustainable drainage systems	Constructed sustainable drainage systems	No. of sustainable drainage systems	NCA/KENHA/ NEMA/CGK/Private Sector	Urban areas/institutions/ Industries /Households	2022-2027	50M
	Constructing water sensitive urban designs	Constructed water sensitive urban designs	No. of water sensitive urban designs constructed	NCA/NEMA/CGK/ Private Sector	Communities living in urban areas	2022-2027	100M
	Manufacturing	Promoting cleaner production technologies	Reduced emissions	No. of industries and factories using cleaner production technologies	KFS/KEFRI/CGK	Industries/ Factories	2022-2027
Reducing reliance on fossil fuels		Reduced reliance on fossil fuels	No. of industries using alternative fuels from fossil fuels	CGK/KOSAP/ EPRA Private sector/ NGOs	Industries/ Factories	2022-2027	3M
Promote use of green energy		More industries using green energy	No. of industries using green energy	CGK/KOSAP/ Private sector/ NGOs	Industries/ Factories	2022-2027	10M

County Climate Change Action Plan (2022-2027)

Energy and transport							
Energy and transport	Investments in climate proofed energy and transport infrastructure	Constructed climate proofed Energy and transport infrastructure	No. of climate proofed Energy and transport infrastructure constructed	NCA/EPRA/KENHA /KURA/KERRA/ NEMA/CGK	General public	2022-2027	200M
	Implementation of the Energy Policy and Act, 2019	Energy and Policy Act, 2019	Energy and Policy Act, 2019	EPRA/CGK/ NEMA	Household / Institutions and Industries	2022-2027	20M
	Development and implementation a County Energy Plan	County Energy Plan	County Energy Plan	EPRA/CGK/ NEMA	Household / Institutions and Industries	2022-2027	20M
	Implementation of the Kenya Off-Grid Solar Access Project	Increased uptake of solar energy	No. of institutions, industries and households using solar energy	CGK/KOSAP/ Private sector / NGOs	Farmers/ Household / Institutions and Industries	2022-2027	10M
	Promoting investments in green energy	Increased uptake of green energy	No. of institutions, industries and households using clean energy	CGK/KOSAP/ Private sector/ NGOs	Farmers/ Household / Institutions and Industries	2022-2027	20M
	Partnerships with national government, NGOs and private sector to invest in large scale clean energy	Increased uptake of green energy	No. of institutions, industries and households using clean energy	CGK/KOSAP/ Private sector/ NGOs	Farmers/ Household / Institutions and Industries	2022-2027	20M
	Establishing community briquettes making schemes at ward level	Established community briquettes making schemes	No. of wards with established Community briquettes making schemes	CGK/Private sector/NGOs/ CBOs	Women Groups/ Households/ CBOs	2022-2027	2M

5 MONITORING AND EVALUATION

5.1 Overview

There is need for coordinated follow up on the progress of plan implementation process through an elaborate monitoring and evaluation framework throughout the plan period (2022-2027). Monitoring and evaluation provide a basis for adaptive management and continuous improvement of the environmental conditions of the County, and guides the continuous measurement of progress indicators throughout the plan implementation stage. It is necessary as it guides the measurement of the achievement of various aspects of proposed management actions.

5.2 Objectives of the Monitoring and Evaluation Framework

1. Establishing implementation status and assess delivery of expected accomplishments
2. Establishing key hindrances and facilitators of success in the implementation process
3. Identifying “correctional” actions as necessary and inform subsequent design of an effective intervention strategy

5.3 Monitoring and Evaluation

As projects and programmes progress from one stage to the next, the smooth transition is a marker that is vividly brought out as a sign of good output evaluation. Progress indicators are necessary especially during the monitoring stage. Evaluation ensures that all the intended outputs and outcomes are as positive as they are indicated within the implementation schedule.

Evaluation generally happens at the end of planning cycle, but in practice monitoring and evaluation activities will often be carried out in parallel with implementation, e.g., to review intermediate outcomes.

The County Climate Change Planning committee will be responsible for overall coordination of the rolling out of the Kwale County Climate Change Action Plan, monitoring and evaluation.

The committee will convene annual planning meetings to review and assess plan implementation progress of works. Additionally, the committee will receive annual monitoring reports to fast track CCCAP operationalization and implementation progress status and also to discuss issues raised during regular monitoring and confirm efficiency and effectiveness of the strategic interventions.

5.4 Reporting

The CCCAP will be prepared and submitted to the County Climate Change Planning committee and the County departmental heads. Key department under each sector are expected to integrate the proposed actions into their Sectoral plans. However regular monitoring biannual briefs will be prepared for implementation updates.

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