# COUNTY GOVERNMENT OF BUSIA

## DEPARTMENT OF LANDS, HOUSING AND URBAN DEVELOPMENT

# URBAN CLIMATE RISK PROFILE FOR BUSIA MUNICIPALITY

## 2025

# FOREWORD

Through the Department of Lands, Housing and Urban Development, the Municipality of Busia has set out to develop this functional profile to address the myriad of challenges related to the Municipal Climate Risk Profile, particularly as it intersects with solid waste management. The review of the Municipality of Busia Climate Risk Profile provides a frame-work to address environmental and climate-related risks in Busia Municipality in line with improved service provision for solid waste management, sanitation, and public health. It also promotes efficient collection and transportation systems, reduction and recycling of waste, and climate-resilient practices for sustainable development anchored on the Sustain-able Development Goals (SDGs).

The review of the Climate Risk Profile is significant to the Municipality of Busia's commitment to intensifying campaigns against improper disposal of waste and its contribution to climate change impacts such as flooding, pollution, and environmental degradation. It ensures a harmonized approach to waste management while reinforcing the Municipality's constitutional mandate for safe, compliant, environmentally sound, and financially sustainable practices that reduce climate-related risks. The profile further provides direction on the management of various aspects of waste management while defining the responsibilities of established institutional arrangements in mitigating climate risks.

The profile addresses critical development challenges at both the Municipal and County levels, thereby enabling the Municipality to implement and adopt integrated strategies that respond to the local climate risk profile effectively. These strategies include the adoption of legislation on packaging waste, controls on hazardous waste, investments in climate-resilient waste handling infrastructure, and measures to combat climate change impacts. Additional strategies include conducting audits of existing waste management infrastructure and local capacity, developing clean-up standards and remediation methods, and encouraging best practices in waste management and resource recovery systems that reduce green house gas emissions. Emphasis is also placed on waste minimization and the establishment of secured and fenced designated disposal sites as part of climate risk mitigation measures.

In collaboration with other stakeholders, the Municipality will sustain the provision of adequate and high-quality waste management services that contribute to climate resilience and environmental protection. Lastly, this profile recommends a legal and institutional framework that supports an integrated approach to improving solid waste management while strengthening the Municipality's response to its climate risk profile.

Hon. Douglas Okiring
County Executive Committee Member for Lands, Housing and Urban Development
**THE COUNTY GOVERNMENT OF BUSIA**

# ACKNOWLEDGEMENT

This profile has been reviewed in compliance with the requirements of the Constitution of Kenya (2010) on the right to a clean and healthy environment, the Municipality of Busia Charter (2018), and the executive transferred functions. This Climate Risk Profile document is a result of inter-departmental participation involving key stakeholders and members of the public of Busia Municipality. The review of the profile targeted the Municipality of Busia's key challenges, including illegal waste dumping, inadequate disposal sites, lack of designated waste collection areas and their contribution to the Municipality's climate risk profile. Implementation of the profile will lead to a sustainable and efficient solid waste management system that supports climate resilience and aligns with the Municipality's mission and vision.

I am deeply indebted to H.E. the Governor of the County Government of Busia for his robust and sustained leadership. I also acknowledge the County Chief Officer–Urban Development and Physical Planning and the County Executive Committee Member for Lands, Housing and Urban Development for their unwavering support, goodwill and guidance.

In addition, I am highly indebted to the Director of Urban Development / CPCT Coordinator for championing the ideals of the Kenya Urban Support Programme (KUSP) I and II. Much appreciation goes to the Department of Environment, Water and Natural Resources for their immense support and valuable input.

The review of the Climate Risk Profile resulted from concerted efforts, consultations and collaboration among all relevant departments, with the aim of making the Municipality of Busia a favourable town for living, economic activities and climate resilience.

Not to be forgotten is the first Municipal Board of Busia for their support, as well as the public and staff of Busia Municipality who invested immense time and effort in making this profile document a reality.

Mr. Norbert Omanyo Wabwire
**Municipal Manager.**
**THE MUNICIPALITY OF BUSIA**

# Executive Summary

Climate change has emerged as a significant challenge to the achievement of Kenya's development goals as defined in Vision 2030. The negative impacts of climate change are impacted on the vulnerable / poor people and third world countries of which Kenya is among them. Kenya as a country is already highly susceptible to climate-related hazards, and projections indicate that the magnitude and frequency of these impacts will intensify in the future. Across Kenya, climate change effects are increasingly evident, severe, and cross-sectoral, with far-reaching implications for infrastructure, livelihoods, ecosystems, and human health.

The Municipality of Busia is experiencing growing climate-related risks driven by rising temperatures, more frequent and intense rainfall events, and recurrent prolonged dry spell conditions. Its strategic location along a major international transport corridor, combined with rapid population growth and urban expansion, heightens its vulnerability to flooding, water scarcity, and public health risks. Past climate-related events have already had substantial impacts on multiple sectors, affecting economic activities, service delivery, environmental integrity, and the overall well-being of residents. This document presents the Climate Risk Profile for the Municipality of Busia, providing a comprehensive assessment of climate hazards, vulnerabilities, and risks and identifying priority adaptation actions to enhance resilience.

The profile is structured in sections, each representing a critical step in understanding climate risks and informing adaptation planning for the municipality. The document begins with background information on Busia Municipality, including its geographic, socio economic, and climatic context, as well as observed climate change trends and their implications. This sectionals outlines the rationale for developing the Climate Risk Profile and describes the methodology applied in the assessment. Subsequent sections examine historical, current, and future climate scenarios, drawing on historical climate records, disaster data, and climate projections to assess evolving risk patterns. The profile further presents hazard mapping and an analysis of exposure and vulnerability characteristics that influence the severity and distribution of climate risks. Based on this analysis, a climate risk assessment is conducted to identify priority risks, followed by the identification of adaptation options.

The document also highlights the sectoral impacts of key climate risks and outlines the governance, financing, and monitoring and evaluation mechanisms to support effective climate adaptation implementation. Overall, the Climate Risk Profile serves as a decision-support tool to guide integrated, evidence-based, and climate-resilient planning and development for Busia Municipality.

The Municipality of Busia Climate Risk Profile will foster better understanding of the Municipality Climate Risks among stakeholders and spark discussions about how to address them effectively. The profile informs contingence planning mechanisms, provides effective strategies for proper resource allocation/ budgetary allocation and pin points climate risks that the public is susceptible to in the Municipality. Residents of the Municipality of Busia have inadequate knowledge to climate risks, their vulnerability hence through the profile, in all tailored interventions are outlined to achieve sustainable development

Risk results summary filled for each key hazard as presented below,

*Table 1. Summary of Urban Flooding risks for the Municipality of Busia*

| Category | Risk Level | | | | |
|---|---|---|---|---|---|
| | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| **Infrastructure & Services** | | | | | |
| Storm water Drainage | Low | Low | High | Medium | High |
| Water and Waste water Management | Low | Low | Medium | Low | Low |
| Solid Waste Management | Medium | Low | High | Medium | High |
| Transport and Mobility | Low | Low | High | Medium | High |
| Energy | Low | Low | High | Medium | High |
| Economic Infrastructure | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Low | Low | Medium | Low | Medium |
| Emergency Services | Low | Low | Medium | Low | Medium |
| **Populations** | | | | | |
| Urban Residents | Low | Low | Medium | Low | Medium |
| Informal Settlement Residents | Low | Low | Medium | Low | Medium |
| Vulnerable and Marginalized Groups | Low | Low | Medium | Low | Medium |
| **Natural Assets** | | | | | |
| Urban Green Infrastructure | Low | Low | Medium | Low | Medium |
| Urban Blue Infrastructure | Low | Low | Medium | Low | Medium |
| Peri-urban and Agricultural Systems | Low | Low | Medium | Low | Medium |

*Table 2 Summary of Prolonged Dry spells risks for the Municipality of Busia.*

| Category | Risk Level | | | | |
|---|---|---|---|---|---|
| | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| **Infrastructure & Services** | | | | | |
| Storm water Drainage | Low | Low | Medium | Low | Low |
| Water and Wastewater Management | Low | Low | Medium | Low | Medium |
| Solid Waste Management | Low | Low | Medium | Low | Low |
| Transport and Mobility | Low | Low | Medium | Low | Low |
| Energy | Low | Low | Medium | Low | Low |
| Economic Infrastructure | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Low | Low | Medium | Low | Medium |
| Emergency Services | Low | Low | Medium | Low | Medium |
| **Populations** | | | | | |
| Urban Residents | Low | Low | Medium | Low | Medium |
| Informal Settlement Residents | Low | Low | Medium | Low | Medium |

| Category | Risk Level | | | | |
|---|---|---|---|---|---|
| | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| Vulnerable and Marginalized Groups | Low | Low | Medium | Low | Medium |
| **Natural Assets** | | | | | |
| Urban Green Infrastructure | Low | Low | Medium | Low | Medium |
| Urban Blue Infrastructure | Low | Low | Medium | Low | Medium |
| Peri-urban and Agricultural Systems | Low | Low | Medium | Low | High |

*Table 3. Summary of Heat Stress risks for the Municipality of Busia*

| Category | Risk Level | | | | |
|---|---|---|---|---|---|
| | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| **Infrastructure & Services** | | | | | |
| Stormwater Drainage | Low | Low | Medium | Low | Low |
| Water & Wastewater Management | Low | Low | Medium | Low | Low |
| Solid Waste Management | Low | Low | Medium | Low | Low |
| Transport and Mobility | Low | Low | Medium | Low | Low |
| Energy | Low | Low | Medium | Low | Low |
| Economic Infrastructure | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Low | Low | Medium | Low | Low |
| Emergency Services | Low | Low | Medium | Low | Low |
| **Populations** | | | | | |
| Urban Residents | Low | Low | medium | Low | Medium |
| Informal Settlement Residents | Low | Low | Medium | Low | High |
| Vulnerable and Marginalized Groups | Low | Low | Medium | Low | Medium |
| **Natural Assets** | | | | | |
| Urban Green Infrastructure | Low | Low | Medium | Low | Medium |
| Urban Blue Infrastructure | Low | Low | Medium | Low | Medium |
| Peri-urban and Agricultural Systems | Low | Low | Medium | Low | High |

*Table 4. Summary of Public Health hazard risks for the Municipality of Busia*

| Category | Risk Level | | | | |
|---|---|---|---|---|---|
| | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| **Infrastructure & Services** | | | | | |
| Storm water Drainage | Low | Low | Medium | Low | Medium |

| Category | Risk Level | | | | |
|---|---|---|---|---|---|
| | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| Water and Waste water Management | Low | Low | Medium | Low | Medium |
| Solid Waste Management | Low | Low | Medium | Low | Medium |
| Transport and Mobility | Low | Low | Medium | Low | Medium |
| Energy | Low | Low | Medium | Low | Medium |
| Economic Infrastructure | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Low | Low | Medium | Low | Medium |
| Emergency Services | Low | Low | Medium | Low | Medium |
| **Populations** | | | | | |
| Urban Residents | Low | Low | Medium | Low | Medium |
| Informal Settlement Residents | Low | Low | Medium | Low | Medium |
| Vulnerable and Marginalized Groups | Low | Low | Medium | Low | Medium |
| **Natural Assets** | | | | | |
| Urban Green Infrastructure | Low | Low | Medium | Low | Medium |
| Urban Blue Infrastructure | Low | Low | Medium | Low | Medium |
| Peri-urban and Agricultural Systems | Low | Low | Medium | Low | Medium |

The climate risk assessment highlights that urban flooding, drought, heat waves, and public health outbreaks pose high risks to the Municipality of Busia due to the convergence of climate hazards with high exposure and vulnerability. The adaptation and resilience strategies are designed to directly address the underlying drivers of risk by reducing exposure, lowering vulnerability and enhancing adaptive capacity. Emphasis is placed on integrated urban planning, climate-resilient infrastructure, ecosystem-based approaches and strengthened institutional and community preparedness. Collectively, these measures support a transition toward a more resilient, inclusive and climate-adaptive urban system in the Municipality of Busia.

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## List of Acronyms

| | |
|---|---|
| AR6 | Sixth Assessment Report |
| GIS | Geographic Information Systems |
| IPCC | Intergovernmental Panel on Climate Change |
| KNBS | Kenya National Bureau of Statistics |
| KPHC | Kenya Population and Housing Census Report |
| M&E | Monitoring and Evaluation |
| NCCRS | National Climate Change Response Strategy |
| NEMA | National Environment Management Authority |
| PPP | Public-private partnerships |
| RCP | Representative Concentration Pathway |
| RCRA | Rapid climate risk assessment |
| SSP | Shared Socio economic Pathway |
| TWG | Technical Working Group |
| WASH | Water, Sanitation, And Hygiene |

# 1. Context

## 1.1. Objective

The Municipality of Busia Climate Risk Profile aims to provide a clear understanding of the current and future climate risks and vulnerabilities, and prioritize adaptation actions for Busia municipality, with the aim of ensuring that all municipal governance processes promote climate resilience. The governance systems and individuals within Busia municipality have to be able to understand the risks they face in order to make informed decisions.

Without major changes in the management of climate risks in the urban centers, threats to residents, the economy and development will increase in the future as populations grow. Climate risks are compounded over time through a complex interaction between development processes that generates conditions of the risks, exposure and vulnerability.

The specific objectives of this climate risk profile are:

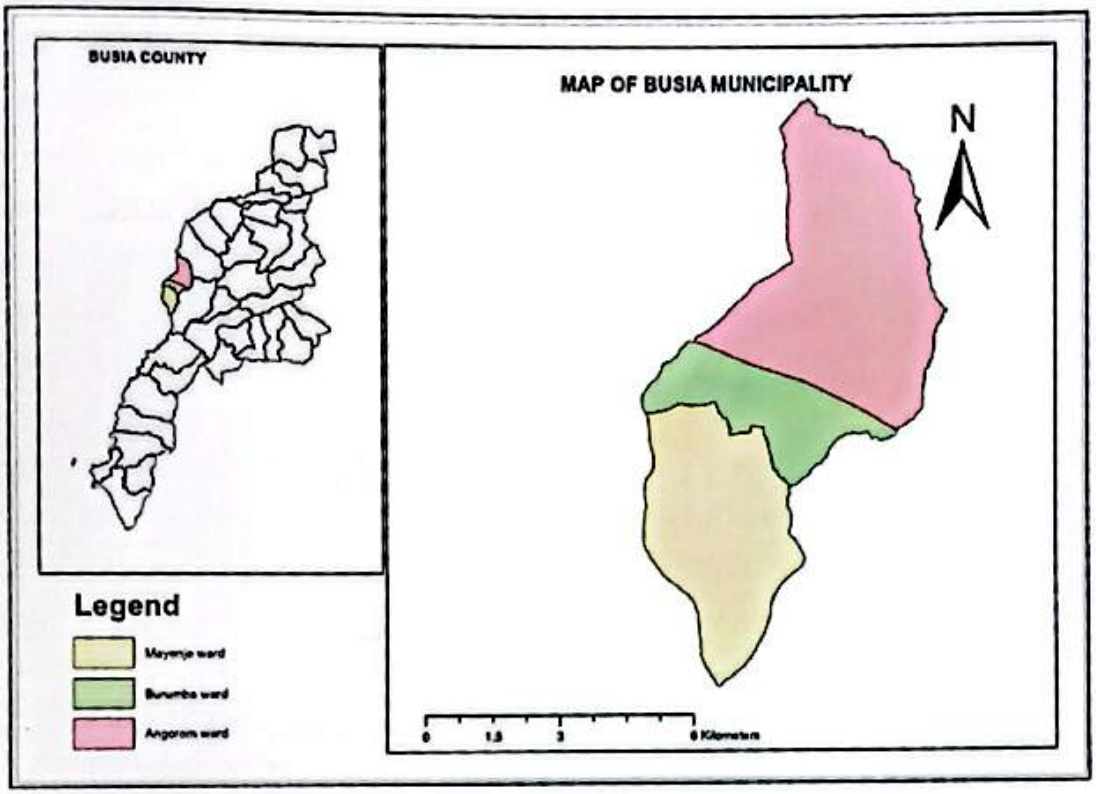
- To identify, highlight and map out climate risks and vulnerabilities sectors within the Municipality of Busia whose impacts affect the living standards of the people.
- To inform adaptation and mitigation measures and aid in the municipality planning processes which provide a foundation to develop effective strategies.
- To improve integration of adequate and measurable climate change adaptation measures in municipality planning processes and development projects.
- To enhance Disaster Risk Reduction (DRR) and to support adequate resource allocation for quick address of current risks.

Increasing the resilience of a population to climate change risks through climate change adaptation and mitigation are matters of development and inclusivity. Risk profiling provides opportunities for strategic actions and enables the municipal government, the County and national governments; civil society partners and the local community to collaborate to strengthen local capacities and leadership to build resilience to climate risk.

## 1.1. Urban Context

### 1.2.1 Geographic area

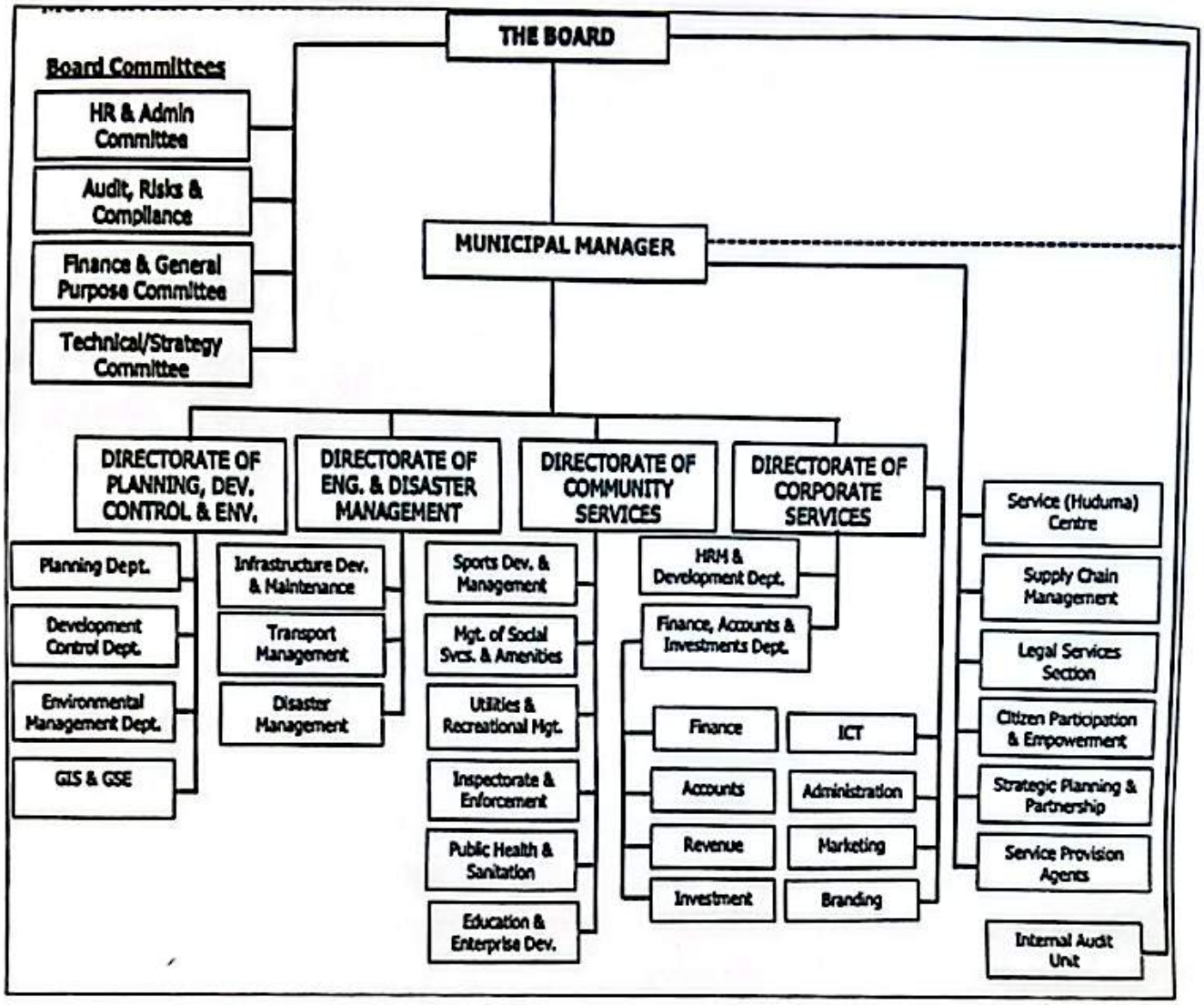
The Municipality of Busia is the most urbanized area in Busia County. The municipality is termed as the headquarters located in the middle-west of the county and covers a surface area of 43.31 square kilometers comprising of three County Assembly electoral areas namely Angorom ward, Burumba ward and Mayenje ward as gazetted in 2nd November, 2018. The western boundary of the municipality also marks Kenya's international border with Uganda.




### 1.1.1. Governance Structure

The governance structure of the Municipality of Busia is clearly defined in the proposed organogram attached herein. At the top of the hierarchy is the board of management which is responsible for the overall direction and final accountability for the affairs of the board.

The Municipal Board conducts its business through specialized committees. Four such committees are envisaged in the Urban Areas and Cities Act 2011 amended 2019. Reporting directly to the board is the Municipal management. The Municipal Manager is the Chief Executive Officer (CEO) of the municipality responsible for daily operations and strategy execution. Development of the Climate risk profile falls under the directorate of planning and development control under the environmental management unit. However, for the purpose of enhancing the quality of the end product, it is imperative to enlist the services of other relevant departments like disaster management, environment, citizen participation and empowerment and inspectorate and enforcement.




### 1.1.2. Socio-economic Context

According to the 2019 Kenya Population and Housing Census report by KNBS, there were 81,643 persons living within the Municipality of Busia in 21,209 households. This population is projected to grow to 99,604 by the year 2029 if an inter-censal growth rate of 2.2 percent is maintained.

***Table1: The Municipality of Busia population by ward, 2019 KPHC-KNBS***

| Ward | Population | No. of households | Area(km2) |
|---|---|---|---|
| Angorom | 35,229 | 9,365 | 21.58 |
| Burumba | 32,908 | 8,659 | 7.21 |
| Mayenje | 13,506 | 3,275 | 14.4 |
| Total | 81,643 | 21,299 | 43.19 |

The population density in Busia town varies from a low of 574 persons per square kilometer in the rural sections of Angorom ward to a high of 4,533 in the most urbanized sections of Burumba ward. By virtue of the fact that the municipality is the county headquarters, it experiences a strain on existing social amenities arising from influx of population from the rest of the county as well as Uganda.

A key institution of major socio-economic impact within the municipality is Alupe University. With an estimated population of 3,800 and growing, the university is expected to exert great impact on the social amenities and economic vibrancy of the municipality particularly due to its influence on demographics.

### 1.1.3. Economic Context

The Municipality of Busia is the main urban center in Busia County. By bordering Uganda it serves as a major economic /business hub for cross-border trade, particularly because of the connectivity provided by the international highway linking Kisumu to Kampala which goes through Busia border post. There are three major livelihoods in the municipality namely, trade, agriculture and both formal and informal employment.

Agriculture is largely subsistence, focusing on rain fed crop production and rearing of livestock. However, there is a rapid urbanization trend within the municipality whereby previous farm land is being converted into urban dwellings to accommodate the growing population.

### 1.1.4. Land-use Context

The Municipality of Busia lies in a predominantly bimodal rainfall zone characterized by long rains (March–May) and short rains (October–December). Climate variability in the region has increased in recent decades, with more frequent and severe dry spells and erratic rainfall patterns.

## 1.2. Key Stakeholders and Inclusiveness

In the development of this climate risk profile, stakeholder engagement was conducted to incorporate local knowledge, validate technical findings, and ensure inclusivity in the climate risk profiling process. The main objective of the engagement was to verify the outputs from TWG discussions and to capture stakeholder perspectives on climate risks, impacts, and priority adaptation needs. Stakeholders engaged included: Municipality representatives; local traders and market associations; transport operators; health officials; community representatives; water service providers. Participatory discussions and consultations helped identify locally experienced climate risks, their impacts and coping strategies. Stakeholder feedback was integrated into the final climate risk profile.

| | | |
|---|---|---|
| High | **High Influence – Low Interest**<br>• National Government<br>• Local community leaders | **High Influence – High Interest**<br>• County Department of Urban Development<br>• County Department of Environment |
| | **Low Influence – Low Interest**<br>• Traders<br>• Transporters | • **Low Influence – High Interest**<br>• Municipality<br>• Water Service Providers<br>• County Department of Health |
| Low | | High |

*Figure 1. Stakeholder mapping for the Municipality of Busia*

## 2. Hazard Assessment

Hazard assessment is a proactive, systematic process to identify potential sources of harm, assess associated risks (likelihood and severity), and implement controls to prevent injuries or incidents. The Municipality of Busia has factored the hazards and the mitigation measures in the municipality plans.

### Key Climate Hazards

*Table 2.1. Hazard screening for the Municipality of Busia*

| Hazard | Hazard Likely (Y/N) | Significant Impact (Y/N) | High Priority (Y/N) | Key Hazard (Y/N) |
|---|---|---|---|---|
| **Heat Stress** | | | | |
| Average surface temperature increase | Y | Y | Y | Y |
| Extreme heat | Y | N | N | N |
| **Prolonged Dry spell** | | | | |
| Average increase in surface temperature during dry season | Y | Y | Y | Y |
| **Urban Flooding** | | | | |
| Changes in precipitation patterns | Y | Y | Y | Y |
| Pluvial (surface level) flooding, including flash flooding and urban flooding | Y | Y | Y | Y |
| Fluvial (river) flooding | N | N | N | N |
| Sea level rise | N | N | N | N |
| Coastal flooding, including storm surges | N | N | N | N |
| Water logging | Y | Y | N | N |
| **Public health risks** | | | | |
| Increase in disease outbreaks | Y | Y | Y | Y |
| Drainage systems | Y | Y | Y | N |
| Waste management | Y | Y | Y | Y |

## 2.1. Climate Indicators and Hazard Thresholds

Climate indicators are measurable observations that show the long-term trends and status of the changing climate system (e.g., global surface temperature and atmospheric $CO_2$ concentrations).

Hazard thresholds are specific critical limits of a climate variable that, if exceeded, can lead to significant impacts, system reorganization, or an abrupt increase in risk to human society, infrastructure, or ecosystems.

*Table 2.2. Climate indicators and hazard thresholds selected for the assessment*

| Key Hazard | Climate indicator | Data source | Threshold | | |
|---|---|---|---|---|---|
| | | | Low | Medium | High |
| Urban flooding | No of days with rainfall more than 50mm | World Bank Climate Change knowledge portal | | 24hrs per season | |
| Prolonged dry spell | No of days with temperatures >28.7C | World Bank Climate Change knowledge portal | | Less than 30% chances of drought occurrence | |
| Heat stress | Days with temperatures frequently exceed 30°C–31°C | World Bank Climate Change knowledge portal | High humidity of above 32°C–33°C | | |
| Public health hazard | No of disease outbreaks | World Health Organization | | Erratic rainfall per season Increased temperature levels. | |

## 2.2. Current Hazard Levels and Climate Projections

Urban flooding in the Municipality of Busia is a significant and escalating challenge, driven by a combination of inadequate infrastructure, rapid urbanization, and intensified climate variability. The town frequently experiences pluvial (surface) flooding and disruption to businesses due to blocked drainages, necessitating urban investment in storm water drainage.

*Table 2.2.1. Current and future hazards levels for the Municipality of Busia*

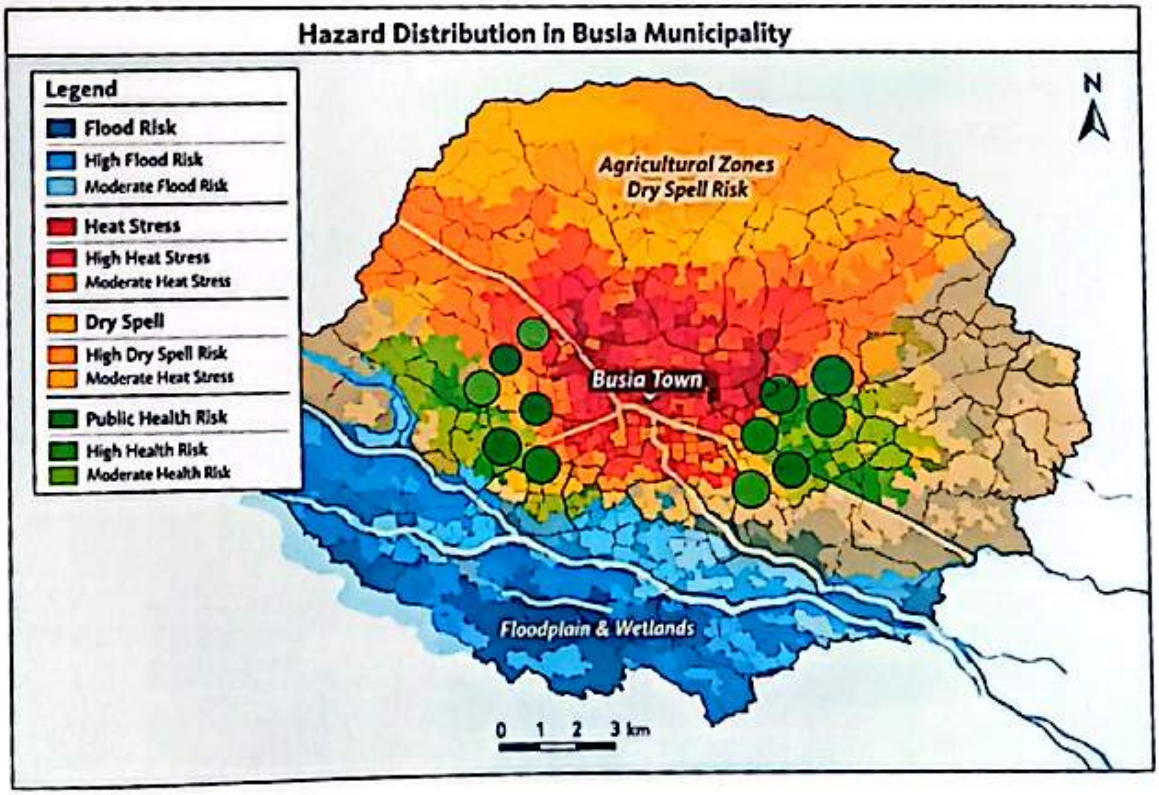
| Hazard | Hazard Level | | | | |
|---|---|---|---|---|---|
| | Current (Baseline) | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| Urban Flooding | Low | 22mm | 30mm | 10mm | 55mm |
| Prolonged dry spell | Medium | 2.5°C | 2.5°C | 3°C | 3°C |
| Heat stress | Medium | -2 days | -2 days | -2 days | -2 days |
| Public health risks. | Medium | Moderate | Low | Low | Moderate |

For this Urban Climate Risk Profile, hazard levels should be interpreted in accordance with the table below.

*Table 2.2.2. Interpretation of hazard levels*

| Level | Interpretation |
|---|---|
| High | Hazard events that are likely to occur with high frequency and/or intensity |
| Medium | Hazard events that are likely to occur with moderate frequency and/or intensity |
| Low | Hazard events that are likely to occur with low frequency and/or intensity |

## 2.3. Current and Future Hazard Impact Areas



## 3. Exposure and Vulnerability Assessment

Exposure and Vulnerability Assessment entail understanding who and what is at risk to climate hazards. Exposure refers to the presence of people, infrastructure, economic activities, and ecosystems in areas susceptible to climate hazards, while vulnerability reflects the degree to which these exposed elements are susceptible to harm due to physical, social, economic, and institutional factors.

In Busia Municipality, exposure and vulnerability are shaped by population density, land-use patterns, quality of infrastructure, access to basic services, and socioeconomic conditions. Climate hazards do not impact all areas or populations equally. Informal settlements, low-income households, critical public infrastructure, and climate-sensitive livelihoods often face disproportionately higher risks due to limited adaptive capacity and pre-existing development challenges.

This section examines the exposure and vulnerability of Busia Municipality to identified climate hazards by analyzing the presence of people, infrastructure, and economic activities in hazard-prone areas, alongside the socioeconomic and environmental factors that influence their susceptibility and adaptive capacity. By integrating demographic, socio economic, environmental, and infrastructure at a, the assessment highlights priority risk hotspots where climate impacts are likely to be most severe.

The findings of the exposure and vulnerability assessment provide a critical link between hazard identification and risk management, informing targeted adaptation measures, resilience-building investments, and climate-responsive urban planning and management for the Municipality of Busia.

### 3.1. Urban Elements

*Table 3.1. Urban elements inventory*

| Category | Subcategory | Included in the RCRA (Y/N) | Available in GIS format (Y/N) | Description |
|---|---|---|---|---|
| **Infrastructure and Services** | | | | |
| Storm water Drainage | Storm water drainage conveyance network | Y | Y | Drains at Nzoia River from the upstream and urban run off |
| | Storm water storage | N | N | |
| Water and Waste water Management | Pumping stations | Y | Y | Pumping at the Sio intake next to R. Sio |
| | Groundwater abstraction | N | N | |

| Category | Subcategory | Included in the RCRA (Y/N) | Available in GIS format (Y/N) | Description |
|---|---|---|---|---|
| | Water treatment facilities | Y | Y | At the pumping intake before distribution to the lines |
| | Water supply networks | Y | Y | Supplied by the Busia Water & Sewerage company (BUWASCO) |
| | Sewer networks | Y | Y | Managed by BUWASCO |
| | Wastewater treatment facilities | Y | Y | Managed by BUWASCO |
| Solid Waste Management | Transfer facilities | N | N | |
| | Landfills and dump sites | Y | Y | Dump site available at Alupe |
| | Recycling centers | N | N | |
| | Collection fleet | Y | Y | Dump trucks available with skip loads. |
| Transport and Mobility | Road networks | Y | Y | Clearly captured in the Kenya Roads Networks and land use plan |
| | Bridges | Y | Y | Clearly captured in the Kenya Roads Networks and land use plan |
| | Public transport networks (rail, bus, mini-bus, etc.) | Y | Y | Presence of motorized transport network |
| | Transportation terminals | Y | Y | the bus terminals are available at designated points. |
| | Vehicle depots | N | N | N/A |
| | Non-motorized transport networks | Y | Y | Presence of foot paths |
| | Freight and logistics hubs | N | N | N/A |
| Energy | Energy power plants | N | N | N/A |
| | Poles and power lines | Y | Y | Kenya power lines available. |
| | Transformers and substations | Y | Y | Kenya Power transformers available. |
| | Street lighting | Y | Y | Presence of street lights on major streets |
| Economic Infrastructure | Markets | Y | Y | Markets available for traders. |
| | Businesses and commercial hubs | Y | Y | Available. |
| | Industrial zones/parks and logistics parks | N | N | N/A |

| Category | Subcategory | Included in the RCRA (Y/N) | Available in GIS format (Y/N) | Description |
|---|---|---|---|---|
| Social Infrastructure | Government buildings and service centers | Y | Y | Government offices available for officers and Huduma Centre. |
| | Education facilities | Y | Y | Learning institutions are available. |
| | Healthcare facilities | Y | Y | Hospitals and health centres. |
| | Public spaces | Y | Y | Presence of a green garden. |
| | Faith-based buildings | Y | N | Places of worship. |
| | Cultural and heritage assets | N | N | N/A |
| Emergency Services | Fire stations | N | N | N/A |
| | Police stations | Y | Y | Available. |
| | Telecommunications networks | Y | Y | Communication networks. |
| | Early warning systems | Y | N | Provided by KMD |
| | Disaster management centers and shelters | N | N | N/A |
| | Evacuation routes | N | N | N/A |
| **Populations** | | | | |
| Urban Residents | Population | Y | Y | As per the recent census. |
| | Households | Y | Y | As per the recent census. |
| Informal Settlement Residents | Population living in informal settlements | Y | Y | Captured in the recent census. |
| | Households lacking land tenure | Y | Y | Land ownership |
| | Households / residents lacking access to basic services | Y | Y | Communities leaving far from basic amenities |
| Vulnerable and Marginalized Groups | Low-income households | Y | N | Earning less than 1 dollar a day. |
| | Women-headed households | Y | N | Available |
| | Children and youth | Y | N | Available |
| | Elderly persons | Y | N | Available |
| | People with disabilities (PWD) | Y | N | Available |
| | Homeless populations | Y | N | Street families |
| | Unemployed or precariously employed workers | Y | N | Available |
| | Seasonal workers / migrant laborers | Y | N | Workers from Uganda |
| | Nomadic groups in peri-urban areas | N | N | N/A |

| Category | Subcategory | Included in the RCRA (Y/N) | Available in GIS format (Y/N) | Description |
|---|---|---|---|---|
| | Urban refugees and migrants | N | N | N/A |
| | Minority ethnic groups in urban areas | Y | N | |
| Natural Assets | | | | |
| Urban Green Infrastructure | Urban parks and gardens | Y | N | Green garden opposite county head quarters |
| | Green corridors | N | N | N/A |
| | Street landscaping | N | N | N/A |
| | Urban forests and forest reserves | N | N | N/A |
| Urban Blue Infrastructure | Natural wetlands | N | N | N/A |
| | Rivers | Y | Y | R. Nzoia, R. Sio |
| | Riparian zones | Y | Y | Sio- Siteko Wetland |
| | Lakes, ponds and reservoirs | N | N | N/A |
| | Coastal ecosystems | N | N | N/A |
| | Urban agriculture | N | N | |
| Peri-urban and Agricultural Systems | Peri-urban agriculture | Y | N | Kitchen gardens |
| | Agro forestry systems | Y | N | Practiced by farmers |
| | Forests and forest reserves | N | N | N/A |
| | Protected areas and national parks | N | N | N/A |
| | Savannahs and rangelands | N | N | N/A |

### 3.2. Exposure, Vulnerability, and Impacts of Climate Hazards on Urban Elements

For this Urban Climate Risk Profile, exposure and vulnerability levels should be interpreted in accordance with the table below.

*Table 3.2.1 Interpretation of exposure and vulnerability levels*

| Level | Exposure Level Interpretation | Vulnerability Level Interpretation |
|---|---|---|
| High | Few or no critical urban elements lie within the hazard footprint or area of impact. | The urban element is vulnerable to the climate hazard due to high natural sensitivity – considering physical and non-physical characteristics – and limited adaptive capacity. |
| Medium | A moderate number or a mix of low- and medium-value urban elements are located within the hazard footprint. | The urban element is somewhat vulnerable to the climate hazard due to moderate sensitivity and adaptive capacity. |
| Low | A large number and high-value urban elements (e.g., critical infrastructure, dense neighborhoods, major economic assets) are located within the hazard footprint. | The urban element is minimally vulnerable to the climate hazard due to limited sensitivity and/or a high degree of adaptive capacity. |

For this Urban Climate Risk Profile, the following matrix summarizes likely impacts on each urban element by combining the assigned exposure and vulnerability levels.

*Table 3.2.2 Impact Matrix*

| | | Vulnerability Level | | |
|---|---|---|---|---|
| | | Low | Medium | High |
| Exposure Level | High | Moderate | Major | Catastrophic |
| | Medium | Minor | Moderate | Major |
| | Low | Insignificant | Minor | Moderate |

*Table 3.3. Exposure, Vulnerability, and Impacts of Urban Flooding on Urban Elements*

**Hazard:** Urban Flooding

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| **Infrastructure & Services** | | | | | |
| Storm water Drainage | Storm water drainage in the Municipality of Busia is heavily exposed to urban flooding due to a combination of rapid, unplanned urbanization, inadequate infrastructure, and poor waste management practices. As a growing border town, increased impervious surfaces such as tarmac roads, pavements, and building rooftops prevent water from seeping into the ground, causing high volumes of surface runoff that overwhelm existing drains. | medium | **Sensitivity:**<br>• Poor waste disposal leading to clogged drainages<br>• Irregular maintenance of drainage systems leading to stagnant water that causes disease.<br>• Disrupted road networks.<br>**Adaptive Capacity:**<br>• Regular collection and proper dumping of solid wastes.<br>• Unclogging of drainage systems through proper maintenance. | Medium | moderate |
| Water & Wastewater Management | Water and wastewater drainage in Busia Municipality is highly exposed to urban flooding due to a combination of inadequate | Medium | **Sensitivity:**<br>• Environmental pollution<br>• Disease outbreak | Medium | Moderate |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| | infrastructure, poor solid waste management, and rapid, unplanned urban development that has overwhelmed existing systems, particularly in areas like Burumba and Mayenje<br>The drainage systems, often open channels, become easily blocked by garbage and silt, causing sewage to mix with storm water and flood homes and businesses during heavy rains. | | **Adaptive Capacity:**<br>• Proper treatment and use of the waste water in farms.<br>• Proper disposal of solid waste at designated sites. | | |
| Solid Waste Management | Solid waste in Busia Municipality exposes the drainage system to urban flooding primarily through the blockage of storm water channels with plastic bottles, polythene bags, and household waste. This mismanagement leads to a situation where, during rain events, these blocked drains cannot handle the runoff, causing water to overflow onto roads and into homes. | Medium | **Sensitivity:**<br>• Blocked drainage systems due to poor waste disposal.<br>**Adaptive Capacity:**<br>• Proper disposal of solid waste<br>• Routine collection of solid waste to avoid clogging. | Medium | Moderate |
| Transport and Mobility | Transport and mobility infrastructure in Busia Municipality is highly exposed to urban flooding due to a combination of inadequate, blocked, and open drainage systems that fail to handle heavy rainfall.<br>These infrastructure gaps result in impassable road networks, disrupted mobility, and economic losses for residents and traders, particularly in areas like Burumba, Mayenje, and Samaki Estate. | Medium | **Sensitivity:**<br>• Disruption of transport networks.<br>• Lack of maintenance of the road networks and poor work man ship<br>**Adaptive Capacity:**<br>• Proper work and maintenance of the road networks by relevant authorities. | Medium | Moderate |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| Energy | Energy infrastructure in the Municipality of Busia is exposed to urban flooding primarily through inadequate storm water drainage systems, resulting in the destruction of electrical infrastructure and disruption of energy services during heavy rains. The flooding is often exacerbated by poor urban planning, including encroached riparian zones and lack of proper waste disposal, leading to power outages and damaged energy assets. | Low | **Sensitivity:**<br>• Risk of transmission and distribution of power<br>**Adaptive Capacity:**<br>• Emergency planning incase of risks. | Low | Minor |
| Economic Infrastructure | Economic infrastructure in Busia Municipality is heavily exposed to urban flooding, primarily driven by inadequate drainage systems, rapid, unplanned urbanization, and poor waste management. This exposure causes significant disruptions to trade, damage to transport networks, and destruction of market facilities, which are vital to the town's role as a cross-border hub. | Low | **Sensitivity:**<br>• Disruption of networks like transport for economic purposes<br>• Poor market conditions dur to waste disposal.<br>**Adaptive Capacity:**<br>• Improve on the market infrastructure.<br>• Routine maintenance of the transport networks. | Low | Minor |
| Social Infrastructure | Key infrastructure—including roads, schools, markets, and health facilities—becomes impassable or submerged during heavy rains, disrupting economic activity and hindering access to essential services. | Medium | **Sensitivity:**<br>• Cut off roads limiting access to key infrastructure.<br>**Adaptive Capacity:**<br>• Routine maintenance of the key infrastructures. | Medium | Moderate |
| Emergency Services | Through submerged road infrastructure, strained emergency response teams, and damaged health facilities. | Medium | **Sensitivity:**<br>• Limited access to the emergency services . | Medium | Moderate |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| | | | **Adaptive Capacity:**<br>• Routine maintenance of road networks to promote accessibility. | | |
| **Populations** | | | | | |
| Urban Residents | Primarily through poorly planned infrastructure, blocked drainage systems, and the encroachment of residential and commercial structures into flood plains. | Medium | **Sensitivity:**<br>• Loss of property and life<br>• Disease outbreaks<br>**Adaptive Capacity:**<br>• Proper drainage systems.<br>• Protection of river line areas | Medium | Moderate |
| Informal Settlement Residents | Informal settlements in Busia Municipality are highly exposed to urban flooding due to a combination of geographical vulnerability, poor infrastructure, and rapid, unregulated development. These settlements often occupy low-lying areas, riverbanks, or wetlands, making them natural collection points for floodwaters<br>. | Medium | **Sensitivity:**<br>• Loss of property and life<br>• Disease outbreaks<br>**Adaptive Capacity:**<br>• Proper drainage systems.<br>• Protection of river line areas | Medium | Moderate |
| Vulnerable and Marginalized Groups | Marginalized residents, particularly those in low-income, informal settlements and riparian zones, face high exposure to floodwaters, leading to displacement, loss of livelihoods, and health crisis. | Medium | **Sensitivity:**<br>• Loss of property and life<br>• Disease outbreaks<br>**Adaptive Capacity:**<br>• Proper drainage systems.<br>• Protection of river line areas | Medium | Moderate |
| **Natural Assets** | | | | | |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| Urban Green Infrastructure | The loss of natural buffers, combined with inadequate drainage systems, has created a negative ecological feedback loop, where reduced vegetation causes increased flooding, which further destroys natural habitats. | Low | **Sensitivity:**<br>• Loss of vegetative cover and clogged drains.<br>**Adaptive Capacity:**<br>• Rehabilitation and unclogging of drains. | Low | minor |
| Urban Blue Infrastructure | Urban blue infrastructure (waterways, natural drainage, and wetlands) in Busia Municipality is heavily exposed to urban flooding due to a combination of inadequate infrastructure, rapid, unplanned, and poor land-use practices. The core, drainage-oriented, and trade-focused urban environment faces high flood risks, particularly in areas like Burumba and Mayanje, where blocked or insufficient drainage systems fail to manage heavy, consistent rainfall | Low | **Sensitivity:**<br>• Encroachment and disruption of vegetative cover<br>**Adaptive Capacity:**<br>• Riverbank protection and awareness creation to the communities. | Low | Minor |
| Peri-urban and Agricultural Systems | The agricultural areas, which often serve as vital food sources for the municipality, are regularly inundated by both flash floods and river line overflows, destroying crops and disrupting livelihoods | Low | **Sensitivity:**<br>• Loss of agricultural land and top soils.<br>**Adaptive Capacity:**<br>• Promotion of tree cover to act as buffers. | Low | Minor |

*Table 3.3 Exposure, Vulnerability, and Impacts of prolonged dry spell on Urban Elements*

**Hazard:** Prolonged Dry Spell

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| **Infrastructure & Services** | | | | | |
| Storm water Drainage | Prolonged dry spells in Busia Municipality significantly impact storm water drainage systems by creating, concealing, and worsening infrastructure vulnerabilities. While drought creates a temporary lack of water flow, it causes systemic issues that culminate in, or exacerbate, flooding once rains return | Low | **Sensitivity:**<br>• Disruption of infrastructure<br>**Adaptive Capacity:**<br>• Use of proper materials to withstand the heat. | Low | Minor |
| Water & Wastewater Management | Drying up local sources, reducing water quality, and causing significant shortages. This increases dependence on unsafe water, leading to waterborne diseases. Wastewater management struggles due to reduced water flow for sanitation, while infrastructure faces strain from increased demand. | Medium | **Sensitivity:**<br>Disease outbreaks and in extreme cases loss of life.<br>**Adaptive Capacity:**<br>Protection of water sources.<br>Proper maintenance of sewer networks. | Medium | moderate |
| Solid Waste Management | Increase in waste accumulation, promoting illegal dumping, and hindering the decomposition of organic matter. | Low | **Sensitivity:**<br>• Environmental pollution<br>• Disease out breaks.<br>**Adaptive Capacity:**<br>• Proper disposal of solid waste.<br>• Awareness creation | Low | Minor |
| Transport and Mobility | Accelerating the deterioration of gravel (murram) roads, causing heavy dust | Low | **Sensitivity:**<br>Disruption of transport networks. | Low | Minor |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| | pollution, and increasing maintenance costs. As a major cross-border town, these impacts hinder transport efficiency and affect economic activities for traders and commuters. | | **Adaptive Capacity:**<br>Routine maintenance of the roads | | |
| Energy | Prolonged dry spells in Busia Municipality, characterized by increased temperatures and water scarcity, have a significant negative impact on the energy sector, primarily by driving up costs and straining infrastructure. | Low | **Sensitivity:**<br>Poor infrastructure.<br>**Adaptive Capacity:**<br>Maintenance of the infrastructure. | Low | Minor |
| Economic Infrastructure | Prolonged dry spells in Busia Municipality significantly disrupt economic infrastructure, primarily impacting water supply, energy, transportation, and agricultural value chains. These climate-related shocks exacerbate existing infrastructure deficiencies, slowing economic growth in manufacturing, wholesale, and retail sectors. | Low | **Sensitivity:**<br>• Disruption of economic livelihood.<br>**Adaptive Capacity:**<br>Routine maintenance of economic infrastructure. | Low | Minor |
| Social Infrastructure | Causes water scarcity, limiting educational opportunities, and endangering public health by overstretching existing resources.<br>. | Low | **Sensitivity:**<br>• Breakdown of services, particularly in schools and healthcare facilities.<br>**Adaptive Capacity:**<br>Rehabilitation of water projects and installation of solar-powered water pumps in schools and markets. | Low | Minor |
| Emergency Services | Prolonged dry spells in Busia Municipality cripple emergency services by causing water shortages, driving food insecurity, increasing fire outbreaks, and enhancing disease risks<br>. | Low | **Sensitivity:**<br>Causes strain in the health facilities and emergency services.<br>**Adaptive Capacity:**<br>Budget for emergency services | Low | Minor |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| **Populations** | | | | | |
| Urban Residents | The dry weather, compounded by high temperatures (often exceeding 32°C between January and March), strains existing infrastructure, exacerbates poor sanitation, and disrupts the primarily trade-oriented economy of the municipality. | Low | **Sensitivity:**<br>Disease outbreak.<br>Disruption of economic livelihoods.<br>**Adaptive Capacity:**<br>• Routine maintenance of the existing infrastructure. | Low | Minor |
| Informal Settlement Residents | It has severe, multifaceted impacts on informal settlements, which are particularly vulnerable due to poor infrastructure, high population density, and low income levels. | Low | **Sensitivity:**<br>• Leads to acute water shortages, food insecurity, economic distress, and health crises.<br>**Adaptive Capacity:**<br>• Provision of safe water and improve better health services. | Low | Minor |
| Vulnerable and Marginalized Groups | Prolonged dry spells in Busia Municipality, driven by climate change and intensified by events like La Niña, have severe, disproportionate impacts on vulnerable groups, particularly women, children, the elderly, and low-income households. | Low | **Sensitivity:**<br>Reduced food security, water scarcity, and economic distress<br>**Adaptive Capacity:**<br>• Provision of safe water and improve better health services. | Low | Minor |
| **Natural Assets** | | | | | |
| Urban Green Infrastructure | It degrades urban green infrastructure, which is already under pressure from rapid urbanization, low tree cover (roughly 1.7%), and encroachment. | Low | **Sensitivity:**<br>The impacts are characterized by a loss of vegetation cover, dehydration of the ecosystem, and a reduction in the capacity of urban areas to provide ecosystem services. | Low | Minor |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| | | | **Adaptive Capacity:**<br>Promote water harvesting to provide water for the conservation of green spaces.<br>Planting of drought resistant trees. | | |
| Urban Blue Infrastructure | It accelerates their degradation, reducing water quality, and shrinking available water supplies. | Low | **Sensitivity:**<br>Exacerbates existing infrastructure deficits, leading to increased maintenance costs and reduced service levels for residents. | Low | Minor |
| | | | **Adaptive Capacity:**<br>Repair of natural drainage systems and protection of river line systems. | | |
| Peri-urban and Agricultural Systems | It exacerbates climate change and human activities like deforestation. | Low | **Sensitivity:**<br>Leads to significant food insecurity, reduced water access, and reduced economic stability. | Low | Minor |
| | | | **Adaptive Capacity:**<br>Promotion of climate smart agriculture. | | |

***Table 3.3 Exposure, Vulnerability, and Impacts of Heat stress on Urban Elements***

**Hazard:** Heat Stress

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| **Infrastructure & Services** | | | | | |
| Storm water Drainage | Primarily by altering rainfall behavior and degrading infrastructure. | Low | **Sensitivity:**<br>Infrastructure degradation. | Medium | Moderate |
| | | | **Adaptive Capacity:**<br>Routine maintenance of the drainage infrastructure | | |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| Water & Wastewater Management | Significant strain on water supply and wastewater management systems, often exacerbating issues of water scarcity, infrastructure overload, and public health risks. | Medium | **Sensitivity:** Increased microbial contamination in water sources, decreased efficiency in wastewater treatment plants, and increased water demand.<br>**Adaptive Capacity:** Integrated water and waste water management | Medium | Moderate |
| Solid Waste Management | The municipality, which relies on a daily collection system and a central dumpsite at Alupe, faces increased risks of illegal dumping, operational inefficiencies, and health hazards for sanitation workers. | Medium | **Sensitivity:** Environmental pollution<br>**Adaptive Capacity:** Proper disposal of waste and sensitization of the public on waste management. | Medium | Moderate |
| Transport and Mobility | High temperatures lead to dehydration and discomfort, reducing commuter travel and forcing reliance on shaded or cooled transport options, often causing transit delays, | Low | **Sensitivity:** Degradation of infrastructure.<br>**Adaptive Capacity:** Routine maintenance of transport networks. | Low | Minor |
| Energy | The impacts range from reduced generation capacity to increased demand and infrastructure strain. | Low | **Sensitivity:** Decrease in energy efficiency.<br>**Adaptive Capacity:**<br>• ...<br>• ... | Medium | Moderate |
| Economic Infrastructure | The municipality's economic infrastructure—including roads, markets, and energy supply—struggles to cope with excessive temperatures, which often leads to reduced economic activity and high maintenance costs . | Low | **Sensitivity:** Increase in demand of agricultural products.<br>**Adaptive Capacity:** Promotion of climate smart agriculture. | Low | Minor |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| Social Infrastructure | The municipality, heavily involved in cross-border trade and agriculture, experiences infrastructure damage, increased health risks, and disruptions to essential services | Low | **Sensitivity:**<br>• Poor health services and reduction in economic gains.<br>**Adaptive Capacity:**<br>Proper utilization of the social infrastructure and awareness creation . | Medium | Moderate |
| Emergency Services | Increased demand for medical services due to disease outbreak. | Low | **Sensitivity:**<br>Increase in heat related diseases.<br>**Adaptive Capacity:**<br>Improve infrastructure to cater for emergencies. | Medium | Moderate |
| **Populations** | | | | | |
| Urban Residents | It leads to increased cases of heat-related illnesses such as dehydration, heat exhaustion, and skin | Low | **Sensitivity:**<br>• Low productivity and income.<br>**Adaptive Capacity:**<br>More surveillance on disease outbreaks. | Low | Minor |
| Informal Settlement Residents | Heat stress in Busia municipality severely impacts informal settlements by creating "urban heat islands" where, due to high-density, low-quality housing materials like corrugated iron sheets, indoor temperatures can be up to 9°C higher than outside, according to studies on similar East African informal settlements. | Low | **Sensitivity:**<br>It affects the living standards through use of poor quality materials.<br>**Adaptive Capacity:**<br>Heat resilient urban planning mechanisms. | Low | Minor |
| Vulnerable and Marginalized Groups | It affects the work ability of casual labourers and living conditions of the elderly and sick in the community. | Low | **Sensitivity:**<br>• Increase in disease outbreaks and food insecurity.<br>**Adaptive Capacity:**<br>• Heat adaptation strategies to aid the vulnerable. | Low | Minor |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| **Natural Assets** | | | | | |
| Urban Green Infrastructure | Limiting its capacity to provide ecosystem services and reducing its functional lifespan | Low | **Sensitivity:**<br>• Reduced plant functionality.<br>• Water scarcity.<br>**Adaptive Capacity:**<br>• Protection of water catchments. | Low | Minor |
| Urban Blue Infrastructure | Characterized by the degradation of water quality, reduction in quantity, and the disruption of ecosystem services, compounded by inadequate, overloaded drainage systems and poor solid waste management. | Low | **Sensitivity:**<br>Degradation of water systems buffers.<br>**Adaptive Capacity:**<br>Rehabilitation of wetland s and drainage systems. | Low | Minor |
| Peri-urban and Agricultural Systems | Significantly disrupts agricultural productivity, livestock health, and the livelihoods of residents in both urban and surrounding peri-urban areas. | Medium | **Sensitivity:**<br>Decline in yields and death of livestock.<br>**Adaptive Capacity:**<br>Promotion of climate smart agriculture | Medium | Moderate |

***Table 3.4 Exposure, Vulnerability, and Impacts of Public Health Risk on Urban Elements***

**Hazard:** Public Health risks

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| **Infrastructure & Services** | | | | | |
| Storm water Drainage | The, dumping of waste into drainage channels causes blockages, resulting in frequent | Medium | **Sensitivity:**<br>Contamination of surface water | Medium | Moderate |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| | flooding, infrastructure destruction, and increased transmission of waterborne diseases | | **Adaptive Capacity:**<br>Routine maintenance of the drainage systems. | | |
| Water & Wastewater Management | The municipality's reliance on non-emptiable pit latrines, broken sewerage exhausters, and limited access to clean water leads to frequent contamination of water sources and the surrounding environment. | Low | **Sensitivity:**<br>Ground water and surface water contamination.<br>**Adaptive Capacity:**<br>Improved wastewater and sanitation infrastructure | Medium | Moderate |
| Solid Waste Management | The accumulation of waste, coupled with the high risk of disease outbreaks, has turned waste management into a critical public health emergency rather than just a sanitation issue. | Low | **Sensitivity:**<br>• Contamination of water and food<br>• Environmental pollution<br>**Adaptive Capacity:**<br>• Sensitization of the public<br>• Proper disposal of waste. | Medium | Moderate |
| Transport and Mobility | These risks, including pandemics (COVID-19, Mpox) and waterborne diseases, disrupt supply chains, cause massive vehicular congestion, and limit the movement of goods and people. | Low | **Sensitivity:**<br>• Disruption of transport systems.<br>• Congestion at the border<br>**Adaptive Capacity:**<br>• Proper screening of transit vehicles. | Medium | Moderate |
| Energy | Key impacts include the disruption of electricity supply, high energy costs for water services, and heavy reliance on polluting biomass fuels<br>. | Low | **Sensitivity:**<br>• High cost of energy.<br>**Adaptive Capacity:**<br>Promotion of clean energy | Low | Minor |
| Economic Infrastructure | The municipality's reliance on cross-border trade, combined with infrastructural | Low | **Sensitivity:**<br>• Disruption of market infrastructure | Medium | Moderate |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| | deficiencies, makes it highly vulnerable to climate-related diseases, water-borne illnesses, and pandemics<br>. | | **Adaptive Capacity:**<br>Implementing the Busia County Climate Change Action Plan (2023–2027) to build disaster-resilient infrastructure | | |
| Social Infrastructure | Public health risks in Busia Municipality, driven by poor sanitation, inadequate water supply, and flooding, heavily impact social infrastructure by overstretching health services, disrupting education, and degrading communal facilities. | Low | **Sensitivity:**<br>Overburdened services.<br>**Adaptive Capacity:**<br>Prioritizing investment in water and sewage systems, improving solid waste management, and enforcing health standards in public spaces. | Medium | Moderate |
| Emergency Services | A critical Kenya-Uganda border hub, significantly strain and impact local emergency services, often overwhelming them due to a combination of disease outbreaks, environmental crises, and high trauma cases. | Medium | **Sensitivity:**<br>• Overstretched emergency services<br>**Adaptive Capacity:**<br>Partnership in emergency responses. | Medium | Moderate |
| **Populations** | | | | | |
| Urban Residents | Driven by poor waste management, inadequate sanitation, frequent flooding, and the rapid spread of communicable and non-communicable diseases. | Low | **Sensitivity:**<br>Increased health risks and economic losses.<br>**Adaptive Capacity:**<br>Integrated waste management and proper infrastructure maintenance. | Medium | Moderate |
| Informal Settlement Residents | Primarily driven by inadequate water, sanitation, and hygiene (WASH) infrastructure, overcrowding, and poor solid waste management, leading to significant disease burdens and economic vulnerability. | Medium | **Sensitivity:**<br>Prevalence of diseases.<br>Economic loss.<br>**Adaptive Capacity:**<br>Better and improved health services and sanitation through provision of clean water. | Medium | Moderate |

| Category | Exposure (Description) | Exposure Level | Vulnerability (Description) | Vulnerability Level | Impact Level |
|---|---|---|---|---|---|
| Vulnerable and Marginalized Groups | These populations often face higher risks of infection and catastrophic health expenditures due to inadequate infrastructure and limited access to healthcare. | Medium | **Sensitivity:**<br>Poor sanitation and increased economic vulnerability.<br>**Adaptive Capacity:**<br>Provision of better sanitation services. | Medium | Moderate |
| **Natural Assets** | | | | | |
| Urban Green Infrastructure | Key challenges include the degradation of green spaces due to solid waste accumulation, contamination of soil, and reduced tree cover during prolonged dry spells<br>. | Low | **Sensitivity:**<br>Soil and environmental contamination<br>**Adaptive Capacity:**<br>• Environmental protection.<br>• Increase in tree cover | Low | Minor |
| Urban Blue Infrastructure | The lack of comprehensive sewerage systems and the contamination of water sources, such as springs and streams, directly compromise the quality of water resources, leading to the spread of waterborne diseases and destruction of natural habitats like Sio Siteko wet land. | Low | **Sensitivity:**<br>• Contamination of water sources.<br>**Adaptive Capacity:**<br>• Sustainable water sources through protection. | Low | Minor |
| Peri-urban and Agricultural Systems | Key issues include a lack of proper sewage systems, limited waste disposal sites, and poor storm water drainage, which directly affect agricultural inputs. | Low | **Sensitivity:**<br>Contamination of crops, water sources and livestock products.<br>**Adaptive Capacity:**<br>Promotion of climate smart agriculture. | Medium | Moderate |

# 4. Climate Risk Assessment

Building on the analysis of climate hazards and the assessment of exposure and vulnerability, this section presents an integrated climate risk assessment for the Municipality of Busia. In line with the IPCC AR6 framework, climate risk is understood as the outcome of the interaction between climate-related hazards, exposure of people, assets, and economic activities, and vulnerability, including sensitivity and adaptive capacity.

The risk assessment synthesizes hazard mapping with socioeconomic, environmental, and infrastructure data to evaluate the likelihood and potential severity of climate impacts across the municipality. This approach recognizes that climate hazards do not pose uniform risks; rather, risk levels vary depending on where hazards coincide with high concentrations of people, critical infrastructure, and vulnerable livelihoods, as well as the capacity of systems and communities to anticipate, cope with, and recover from climate-related shocks.

For the Municipality of Busia, the assessment focuses on four priority climate hazards such as urban flooding, drought, heat waves, and public health outbreaks, which pose significant threats to human well-being, service delivery, economic productivity and environmental sustainability. By qualitatively scoring and comparing risk levels across these hazards, the assessment identifies high-risk hotspots and priority sectors requiring urgent and targeted adaptation interventions.

The outcomes of this risk assessment provide an evidence-based foundation for climate-resilient urban planning, disaster risk reduction, and the prioritization of adaptation actions aimed at reducing vulnerability and enhancing resilience within the Municipality of Busia.

For this Urban Climate Risk Profile, the following matrix summarizes overall risk for each urban element by combining the assessed hazard level and the estimated impact level.

***Table 4.01 Risk matrix***

| | | Hazard Level | | |
|---|---|---|---|---|
| | | **Low** | **Medium** | **High** |
| **Impact Level** | **Catastrophic** | High | Very High | Very High |
| | **Major** | Medium | High | Very High |
| | **Moderate** | Low | Medium | High |
| | **Minor** | Low | Low | Medium |
| | **Insignificant** | Very Low | Low | Low |

For this Urban Climate Risk Profile, risk levels should be interpreted based on the table below.

***Table 4.02 Interpretation of risk levels***

| Level | Interpretation |
|---|---|
| Very High | Very high risks are unacceptable. Risk should be avoided, reduced or transferred. Immediate planning and implementation of risk reduction measures is required. Allocate resources and coordinate interventions to prevent or minimize impact. |

| | |
|---|---|
| High | High risks should be actively addressed. Develop and implement mitigation actions promptly. Monitor environmental indicators and ensure readiness of emergency or adaptation measures. |
| Medium | Medium risks should be managed. Plan and implement mitigation activities to reduce them to acceptable levels. Regularly review climate data and risk levels. |
| Low | Low risks are acceptable under current conditions. Minimal control or monitoring is needed, provided they remain stable and do not escalate. |
| Very Low | Very low risks are negligible in terms of likelihood and consequences. No immediate action is required beyond routine monitoring and periodic review. |

## 4.1. Current and Future Climate Risks on Urban Elements

*Table Summary of Urban Flooding risks for the Municipality of Busia*

| | Time Horizon& Climate Scenario | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
|---|---|---|---|---|---|---|
| | **Hazard Level** | | | | | |
| **Categories** | **Impact** | **Risk Levels** | | | | |
| | | **Current** | **2050 SSP2-4.5** | **2050 SSP5-8.5** | **2100 SSP2-4.5** | **2100 SSP5-8.5** |
| **Infrastructure & Services** | | | | | | |
| Storm water Drainage | Moderate | Low | Low | High | Medium | High |
| Water & Wastewater Management | Moderate | Low | Low | Medium | Low | Low |
| Solid Waste Management | Moderate | Medium | Low | High | Medium | High |
| Transport and Mobility | Minor | Low | Low | High | Medium | High |
| Energy | Minor | Low | Low | High | Medium | High |
| Economic Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Moderate | Low | Low | Medium | Low | Medium |
| Emergency Services | Moderate | Low | Low | Medium | Low | Medium |
| **Populations** | | | | | | |
| Urban Residents | Minor | Low | Low | Medium | Low | Medium |

| | | | | | | |
|---|---|---|---|---|---|---|
| Informal Settlement Residents | Minor | Low | Low | Medium | Low | Medium |
| Vulnerable and Marginalized Groups | Minor | Low | Low | Medium | Low | Medium |
| **Natural Assets** | | | | | | |
| Urban Green Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Urban Blue Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Peri-urban and Agricultural Systems | Minor | Low | Low | Medium | Low | Medium |

***Table 4.1 Summary of Prolonged Dry spell risks for Busia Municipality***

| | **Time Horizon and Climate Scenario** | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
|---|---|---|---|---|---|---|
| | **Hazard Level** | | | | | |
| **Categories** | **Impact** | **Risk Levels** | | | | |
| | | **Current** | **2050 SSP2-4.5** | **2050 SSP5-8.5** | **2100 SSP2-4.5** | **2100 SSP5-8.5** |
| **Infrastructure & Services** | | | | | | |
| Storm water Drainage | Minor | Low | Low | Medium | Low | Low |
| Water & Wastewater Management | Moderate | Low | Low | Medium | Low | Medium |
| Solid Waste Management | Moderate | Low | Low | Medium | Low | Low |
| Transport and Mobility | Minor | Low | Low | Medium | Low | Low |
| Energy | Minor | Low | Low | Medium | Low | Low |
| Economic Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Emergency Services | Moderate | Low | Low | Medium | Low | Medium |
| **Populations** | | | | | | |
| Urban Residents | Minor | Low | Low | Medium | Low | Low |
| Informal Settlement Residents | Minor | Low | Low | Medium | Low | Medium |
| Vulnerable and Marginalized Groups | Minor | Low | Low | Medium | Low | Low |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Natural Assets** | | | | | | |
| Urban Green Infrastructure | Minor | Low | Low | Medium | Low | Low |
| Urban Blue Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Peri-urban and Agricultural Systems | Minor | Low | Low | Medium | Low | High |

*Table 4.1 Summary of Heat Stress risks for Busia Municipality*

| | **Time Horizon & Climate Scenario** | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
|---|---|---|---|---|---|---|
| | **Hazard Level** | | | | | |
| **Categories** | **Impact** | **Risk Levels** | | | | |
| | | **Current** | **2050 SSP2-4.5** | **2050 SSP5-8.5** | **2100 SSP2-4.5** | **2100 SSP5-8.5** |
| **Infrastructure & Services** | | | | | | |
| Storm water Drainage | Minor | Low | Low | Medium | Low | Low |
| Water and Waste water Management | Moderate | Low | Low | Medium | Low | Low |
| Solid Waste Management | Moderate | Low | Low | Medium | Low | Low |
| Transport and Mobility | Minor | Low | Low | Medium | Low | Low |
| Energy | Minor | Low | Low | Medium | Low | Low |
| Economic Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Minor | Low | Low | Medium | Low | Low |
| Emergency Services | Minor | Low | Low | Medium | Low | Low |
| **Populations** | | | | | | |
| Urban Residents | Minor | Low | Low | medium | Low | Medium |
| Informal Settlement Residents | Minor | Low | Low | Medium | Low | High |
| Vulnerable and Marginalized Groups | Minor | Low | Low | Medium | Low | Medium |
| **Natural Assets** | | | | | | |
| Urban Green Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Urban Blue Infrastructure | Minor | Low | Low | Medium | Low | Medium |

| | | | | | | |
|---|---|---|---|---|---|---|
| Peri-urban and Agricultural Systems | Minor | Low | Low | Medium | Low | High |

*Table 4.1 Summary of Public Health risks for the Municipality of Busia*

| | Time Horizon & Climate Scenario | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
|---|---|---|---|---|---|---|
| | Hazard Level | | | | | |
| Categories | Impact | Risk Levels | | | | |
| | | Current | 2050 SSP2-4.5 | 2050 SSP5-8.5 | 2100 SSP2-4.5 | 2100 SSP5-8.5 |
| **Infrastructure & Services** | | | | | | |
| Stormwater Drainage | Moderate | Low | Low | Medium | Low | Medium |
| Water & Wastewater Management | Moderate | Low | Low | Medium | Low | Medium |
| Solid Waste Management | Moderate | Low | Low | Medium | Low | Medium |
| Transport and Mobility | Minor | Low | Low | Medium | Low | Medium |
| Energy | Minor | Low | Low | Medium | Low | Medium |
| Economic Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Social Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Emergency Services | Major | Low | Low | Medium | Low | Medium |
| **Populations** | | | | | | |
| Urban Residents | Moderate | Low | Low | Medium | Low | Medium |
| Informal Settlement Residents | Moderate | Low | Low | Medium | Low | Medium |
| Vulnerable and Marginalized Groups | Moderate | Low | Low | Medium | Low | Medium |
| **Natural Assets** | | | | | | |
| Urban Green Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Urban Blue Infrastructure | Minor | Low | Low | Medium | Low | Medium |
| Peri-urban and Agricultural Systems | Minor | Low | Low | Medium | Low | Medium |

## 4.2. Climate Risk Hotspots

### 4.2.1: Urban Flooding

Urban flooding in Busia Municipality is a significant challenge characterized by a mix of flash floods caused by inadequate drainage and rive line flooding from nearby rivers. Flooding is largely driven by poor storm water drainage systems within the urban set up, particularly in densely populated areas. Within Burumba and Mayenje wards , there have been cases of flash floods that have disrupted livelihoods.

The Busia bus park has been noted as an area requiring urgent intervention due to poor storm water drainage. Other areas with substandard stalls and inadequate bitumen roads are highly susceptible.

### 4.2.2: Prolonged Dry Spells

The prolonged dry spells within the urban set up is around the border point and Busia town which covers Burumba and Angorom wards. This is characterized by:

- High demand for water both for domestic and commercial uses.
- Limited water storage systems.
- Heat retention from buildings that lead to increase in evaporation.

The impacts are mainly high cost of water, water shortages and public health stress.

### 4.2.3: Heat Stress

High heat stress within the urban set up is within Angorom and Burumba wards mainly at the Central Business District, Border point and the dense commercial and residential areas. These are characterized by:

- High building density
- Very limited green cover
- High human and vehicle activities.
- Heat trapped during day and night.

The impacts are felt through heat exhaustion and dehydration, increased energy demand and reduced productivity.

### 4.2.4 : Public Health risks.

Within Busia Municipality, public health risk is spatially clustered and driven by population density, sanitation, cross border movement and drainage. These are mainly within Angorom and Burumba wards.

The risks are characterized by

- High population concentration
- Heavy cross – border movement
- Poor sanitation and waste management
- Congested housing.

## 5. Key Findings

*Table 5.0 Summary of climate risks affecting urban elements for the Municipality of Busia*

| Category | List of Key Hazards | | |
|---|---|---|---|
| | Current | Mid-term (2050) | Long-term (2100) |
| **Infrastructure & Services** | | | |
| Storm water Drainage | Urban floods | Urban floods | Urban floods |
| Water and Waste water Management | Public health risk Urban floods | Public health risk Urban floods | Public health risk Urban floods |
| Solid Waste Management | N/A | Urban floods | Urban floods |
| Transport and Mobility | N/A | N/A | Urban floods |
| Energy | N/A | N/A | Urban floods |
| Economic Infrastructure | N.A | N/A | Urban floods |
| Social Infrastructure | N/A | Public health risk Urban floods | Public health risk Urban floods |
| Emergency Services | Public health risk Urban floods | Public health risk Urban floods | Public health risk Urban floods |
| **Populations** | | | |
| Urban Residents | | | |
| Informal Settlement Residents | Public health risk | Public health risk | Public health risk Urban floods |
| Vulnerable and Marginalized Groups | Public health risk Urban floods | Public health risk Urban floods | Public health risk Urban floods |
| **Natural Assets** | | | |
| Urban Green Infrastructure | N/A | N/A | Urban floods |
| Urban Blue Infrastructure | N/A | Prolonged dry spells | Prolonged dry spells |
| Peri-urban and Agricultural Systems | N/A | Prolonged dry spells and urban floods | Prolonged dry spells and urban floods |

From the above analysis, urban flooding poses a threat to the key infrastructure both at the midterm and long-term levels. There is need for the municipality to consider lasting remedial measures to mitigate the effects of urban flooding.

Prolonged dry spells mainly affect the agricultural systems that are key economic activity within the rural set up of the municipality. Promotion and adoption of climate smart agriculture is key intervention to boost food security.

Public health risks within the midterm and long term will mainly affect the informal settlements and the quality of water as a result of poor sanitation. There is need to increase the sewer coverage and enhance sanitation measures within the municipality to curb outbreak of diseases.

## 5.1. Climate Adaptation and Resilience Solutions

*Table 5.1. Climate adaptation and resilience solutions recommended for Busia Municipality*

| Category | Recommended Solutions | | |
|---|---|---|---|
| | Immediate | Mid-term | Long-term |
| **Infrastructure & Services** | | | |
| Storm water Drainage | Routine Clearing of Drainage Systems through immediate clearing of debris, leaves, and trash from storm drains, culverts, and pipes so as to control clogging of drainages. | • Redesign and resize drains using updated drainage projections.<br>• Upgrade culverts and cross drainage structures on the roads. | • Develop an integrated Urban Storm Water Master Planning. |
| Water and Waste water Management | • Emergency Sewer Rehabilitation by unblocking, cleaning, and repairing critical sewer networks to prevent overflows and environmental contamination.<br>• Rainwater Harvesting by installing temporary storage tanks and catchment systems to collect and store rain for immediate, non-potable, or treated household use | • Rehabilitation and expansion of water supply systems mainly at the rural set ups.<br>• Expansion and upgrading of sewer systems. | • Develop integrated Water Resources Management.<br>• Circular economy approaches on waste water management. |
| Solid Waste Management | • Mandatory waste segregation at source<br>• Improve collection and transport infrastructure.<br>• Establish composting programs for organic wastes. | • Development of transfer stations.<br>• Promotion of recycling and composting. | • Development of an Integrated Solid Waste Management systems. |
| Energy | • Install solar street lightings. | • Renewable energy expansions. | • Ensure energy access and Equity. |

| Category | Recommended Solutions | | |
|---|---|---|---|
| | Immediate | Mid-term | Long-term |
| Economic Infrastructure | • Install water storage tanks in markets and industries.<br>• Improve surface drainage and waste removal. | • Rehabilitation and upgrading of existing infrastructure. | • Sustainable and inclusive infrastructure planning. |
| Social Infrastructure | • Improve drainage and access paths.<br>• Protect water sources with fencing and vegetation buffers. | • Upgrading and rehabilitating of existing infrastructure | • Establishing sustainable and resilient designs. |
| Emergency Services | • Proper and regular maintenance of the emergency systems. | • Training and capacity building of personnel.<br>• Early warning systems. | • Integrated emergency management systems |
| **Populations** | | | |
| Urban Residents | • Tree planting and shade structures to control effects of heat stress.<br>• Establish community climate committees and rapid climate risks awareness campaigns. | • Upgrading urban infrastructure for climate resilience.<br>• Improving early warning and emergency preparedness | • Comprehensive climate -resilient urban planning. |
| Informal Settlement Residents | • Installing basic drainage and water services to control spread of diseases from floods. | • Upgrading existing infrastructure | • Integrating settlement upgrading and development |
| **Natural Assets** | | | |
| Urban Green Infrastructure | • Plant fast growing trees along the roads to control the urban heat stress.<br>• Rainwater harvesting from roof tops of buildings.<br>• Restore and desilt natural drainage channels and riparian buffers. | • Permeable pavement implementations<br>• Targeted green space expansion. | • Green -gray hybrid infrastructure.<br>• Mainstreaming green policies |

| Category | Recommended Solutions | | |
|---|---|---|---|
| | Immediate | Mid-term | Long-term |
| Peri-urban and Agricultural Systems | • Rain water harvesting through farm ponds, roof tops and water pans.<br>• Contour farming and terracing.<br>• Promotion of kitchen gardens and agro forestry practices. | • Integrating crop -livestock systems.<br>• Organic waste recycling | • Integrating land -use planning and zoning. |

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# Annex 1. Historical Hazard Events(optional)

| | |
|---|---|
| **Hazard Event/Type** | Urban Flooding |
| **Date or Period** | 2023 |
| **Location** | Outskirts of Burumba ward and parts of Mayenje |
| **Intensity** | [Provide a brief narrative description of how the hazard was experienced in the urban area(e.g., flood depth, duration and location).] |
| **Social Impacts** | There was displacement of people living withing the low lying areas where flooding was experienced with elderly people being most affected. There was also outbreak of malaria due to increased breeding grounds; stagnant water as a result of blocked drainages. |
| **Physical Impacts** | Flooding was experienced in residential houses and transport sector was disrupted as parts of the roads were cut off |
| **Economic Impacts** | Busia municipality being a hub for cross border trade, urban flooding led to disruption of the trade especially around Marachi area thus loss of goods. |
| **Ecological Impacts** | Busia municipality experienced both soil and land degradation as a result of floods within the peri- urban set up thus affecting agriculture and food production. |

# Mission

Transform the Municipality into an excellent institution in unmatched service delivery and infrastructure development

# Core Values

Efficiency in service delivery
Respect of community
Unity of purpose
integrity in operations
Accountability

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