DRR4AFRICA

DISASTER RISK REDUCTION:
A RESILIENCE AGENDA 4 URBAN AFRICA

Cape Coast Baseline Assessment

2025

FUNDER

IMPLEMENTER

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ABBREVIATIONS

CCMA Cape Coast Metropolitan Assembly
CCTU Cape Coast Technical University
CHIRPS Climate Hazards Group InfraRed Precipitation with Station data
CSO Civil Society Organisation
CVA Climate Vulnerability Assessment
DRR Disaster Risk Reduction
EPA Environmental Protection Agency
GDP Gross Domestic Product
GHS Ghana Health Service
GIZ Deutsche Gesellschaft für Internationale Zusammenarbeit
GMET Ghana Meteorological Agency
GSS Ghana Statistical Service
HDI Human Development Index
IPCC Intergovernmental Panel on Climate Change
MPU Municipal Planning Unit
MTDP Medium-Term Development Plan
NADMO National Disaster Management Organisation
NAP National Adaptation Plan
NDC Nationally Determined Contribution
NDPC National Development Planning Commission
NGO Non-Governmental Organisation
RCP Representative Concentration Pathways
SPC Spatial Planning Committee
UCC University of Cape Coast
UNDRR United Nations Office for Disaster Risk Reduction
UNESCO United Nations Educational, Scientific and Cultural Organization

1 INTRODUCTION

This Baseline Report provides an overview of the status of disaster resilience in the city of Cape Coast in Ghana, through an understanding of the climate hazards that affect the city as well as assessing the city's disaster preparedness and response. Fundamental information on the climate hazards is drawn from the findings of the Climate Vulnerability Assessment (CVA) for the Cape Coast Metropolitan Assembly (CCMA) developed by the Environmental Protection Agency (EPA) (EPA, 2024). The CVA provides a comprehensive assessment of these hazards and their impacts on the city, and these findings are summarised and supplemented with additional information. The city's disaster resilience was assessed using the UNDRR Disaster Resilience Scorecard for Cities which allows local governments to assess their disaster resilience.

Gathering the additional CVA information and completing the city's scorecard were undertaken through a multi-stakeholder participatory workshop held on 25-26 June 2024 in Cape Coast. The event had 29 attendees, of whom 18 were officials from the CCMA and 10 were women. In the workshop, participants discussed key climate change and disaster resilience concepts before completing the CVA activities and the scorecard to ensure a shared understanding of all stakeholders. Gathering the information was carried out in a participatory and inclusive process, with all stakeholders engaged to determine results for their city. Several Departments within the CCMA were represented, including:

- Administration
- Agriculture
- Budgeting
- Development Planning
- Environmental Health Unit
- Gender
- Metropolitan Education Directorate
- Physical Planning
- Social Welfare and Community Development
- Statistics
- Urban Roads
- Waste Management
- Works

Other organisations represented were:

- National Disaster Management Organisation (NADMO)
- Environmental Protection Agency (EPA)
- Ghana Health Service (GHS)
- Metropolitan Education Directorate
- Oguaa Traditional Area
- Centre for Environment, Natural Resources and Sustainability
- Cape Coast Technical University (CCTU)
- University of Cape Coast (UCC)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

The CVA developed by the EPA aims to improve the national and subnational government officials' understanding of current and future climate hazards, vulnerabilities, and risks. Through this, the CVA is also meant to guide adaptation planning and the identification of priority adaptation actions, as well as providing a baseline against which progress in adaptation could be monitored and evaluated. During the workshop, the stakeholders were engaged to gather supplementary information on specific vulnerabilities of different population groups in the city as well as to establish an adaptation vision for Cape Coast.

The Scorecard structures the assessment of a city around UNDRR's Ten Essentials for Making Cities Resilient (Figure 1). The Scorecard can also be used to help monitor and review progress, and challenges, in the implementation of The Sendai Framework for Disaster Risk Reduction (2015-2030) and supports the baseline analysis for preparation of the disaster risk reduction and resilience strategies.

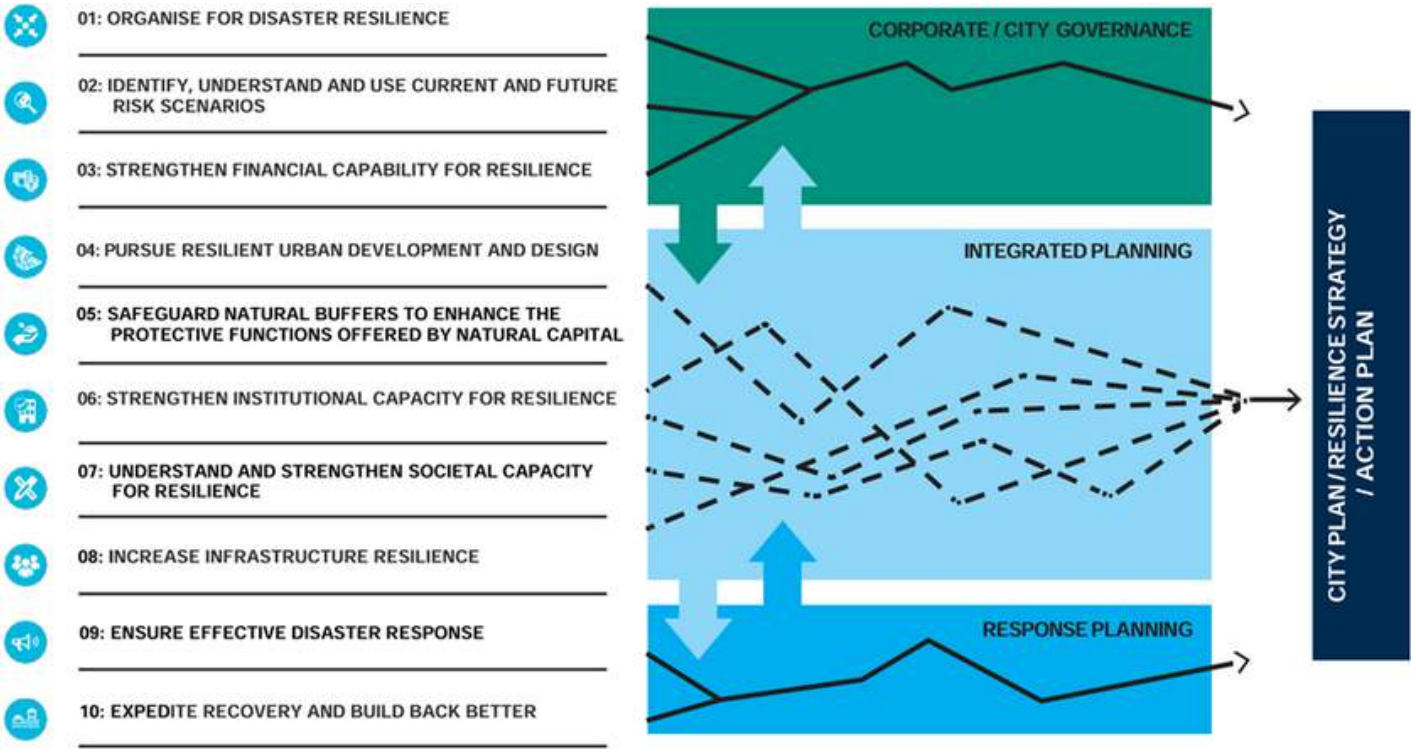


Figure 1. Using the UNDRR Disaster Resilience Scorecard for Cities and its basis on the Ten Essentials for Making Cities Resilient to inform effective DRR action planning (UNDRR, 2017).

Completing the additional CVA activities and the Preliminary Level Scorecard opened dialogues with the various departments and stakeholders on the issues related to disaster risk reduction and resilience in the city of Cape Coast. The exercise also represented the first step in establishing a community of practice for DRR in the city, bringing the various stakeholders together for collaborative efforts to address DRR challenges. The cross-cutting nature of DRR requires that this community of practice includes all relevant stakeholders so that the city's resilience needs can be addressed holistically.

2 OVERVIEW OF CAPE COAST, GHANA

2.1 CITY CONTEXT

The CCMA, located in the Central Region of Ghana, is the country's smallest metropolis with an area of 122 km2 (Figure 2). Cape Coast experiences average annual temperatures of 26°C, and rainfall is bimodal, peaking in May-June and October, with average annual totals of 750–1,000 mm. Rainfall decreases toward the southern parts of the metropolis, while daytime temperatures reach higher maximums and drop more significantly at night further north in the city. The city hosts significant natural assets (including beaches, botanical gardens, lagoons, mangroves, parks, ponds, protected areas, rivers, shrublands/grasslands, trees/forest/woodlands, and wetlands), occupying approximately 85 km2 and thusrepresenting about 71% of the entire metropolis' area (ICLEI Africa, 2022).

Cape Coast is home to approximately 189,925 people, of whom 49% are male and 51% are female (GSS, 2024). While the population is predominantly urban (76.7%), about 65% of Cape Coast's inhabitants engage in agriculture, typically as peasant farmers (62%; CCMA, 2017) farming oil palm, maize, cassava, plantain and livestock. The metropolis also features private-sector construction industries and tourism is a growing sector in Cape Coast, recognized as Ghana's tourism and hospitality hub. The Cape Coast Castle, a UNESCO World Heritage site, and the city's beaches make Cape Coast a leading destination for tourists in Ghana.

Cape Coast is a hub for healthcare and education services, hosting key facilities that support a substantial portion of the region. The city has three principal hospitals: Cape Coast Teaching Hospital, Cape Coast Metro Hospital, and the University of Cape Coast (UCC) Hospital, with 400, 115, and 80-bed capacities respectively. Cape Coast also hosts the main campus of the UCC and the Cape Coast Technical University (CCTU), as well as 19 secondary and technical schools.

Figure 2. The Cape Coast Metropolitan Assembly in the Central region of Ghana (Google Earth Data SIO, NOAA, U.S. Navy, NGA, GEBCO, Image Landsat/Copernicus).

ADMINISTRATION

The CCMA holds 16 Departments and other Units with Heads of Departments reporting directly to the Metropolitan Coordinating Director, and ultimately, to the Metropolitan Chief Executive (the "Mayor"). The city's General Assembly has 66 Members composed of 41 Elected Members, 25 Government Appointees, 2 Members of Parliament, and the Metro Chief Executive who also chairs the Executive Committee. The CCMA performs its functions through 14 Sub-Committees, with recommendations submitted to the Executive Committee and then to the General Assembly.

The 14 Sub-Committees are:

1. Social Services
2. Finance and Administration
3. Development Planning, Revenue Mobilization
4. Justice and Security
5. Education
6. Works
7. Environment
8. Youth and Sports
9. Culture and Trade
10. Tourism and Industry
11. Disaster Management
12. Food and Agriculture
13. Health
14. Women and Children.

2.2 ADAPTATION AND DRR POLICY

As climate change impacts are context-specific, Ghana's National Adaptation Plan (NAP) emphasises the need for adaptation planning that reflects geographical variations in vulnerabilities. The NAP Framework aims to reduce vulnerability by building adaptive capacity and resilience within local communities. A district-focused approach grounds this process, using district-level vulnerability assessments to inform adaptation plans tailored to climate-sensitive sectors like agriculture, forestry, water, energy, gender, and health. These standalone plans integrate local vulnerabilities and geographical factors to support effective, proactive adaptation action at the district level.

In Ghana's Updated Nationally Determined Contribution (NDC) under the Paris Agreement (2020-2030), 19 policy actions were developed in 10 priority areas. There are 13 adaptation programmes of action derived from the policy actions, seeking to maximise the synergies between adaptation and economic diversification and resulting in mitigation co-benefits. Relevant long-term outcomes included:

- Accelerate sustainable energy transition
- Build resilient economies and societies
- Enhance early warning and disaster risk management
- Enhance landscape restoration
- Ensure responsible production and consumption
- Foster social inclusion focusing on youth and women
- Provide smart and safe communities

The adaptation policy actions presented in Ghana's Updated NDC are:

- Manage climate-induced and gender-related health risks.
- City-wide resilient infrastructure planning
- Integrated water resources management.
- Enhance climate services for efficient weather information management.
- Early warning and disaster risk management.
- Build resilience and promote livelihood opportunities for the youth and women in climate-vulnerable Agriculture landscapes and food systems.
- Enhance climate resilience of women and the vulnerable.
- Promote gender-responsive sustainable forest management.

National policies are thus aligned to support adaptation and resilience actions, with a focus on vulnerable groups of women and youth. There is a need to develop a local-level resilience plan that is suited to the needs of the city, which is being initiated through the NAP process with the district-level CVAs and initiatives like the Covenant of Mayors in Sub-Saharan Africa. Establishing local-level resilience plans must also be accompanied by adequate local government budgetary and resource allocations for these plans to be effectively implemented.

2.3 KEY STAKEHOLDERS

The cross-cutting nature of DRR planning and action result in there being numerous stakeholders relevant to strengthening resilience in the city of Cape Coast ranging from national and regional government entities to academia, development partners, NGOs/ CSOs, the private sector, vulnerable communities, traditional authorities, and the media. Most central to the process are those with the relevant jurisdiction over DRR actions, and those involved in city planning and emergency response. Thus, key stakeholders were identified as:

- National Disaster Management Organisation (NADMO): Coordinates adaptation planning and mainstreaming at the district level, promotes disaster risk reduction and climate resilience, provides disaster relief assistance, and aids in social mobilisation for disaster prevention and poverty alleviation.
- National Development Planning Commission (NDPC): Generates and coordinates policy frameworks for national development and ensures that corresponding strategies and plans are effectively implemented at the district level.
- Ghana Meteorological Agency (GMET): Collects, analyses and disseminates reliable meteorological information.
- Environmental Protection Agency (EPA): Oversees monitoring of pollution, sanitation, environmental protection and climate action while leading the NAP process.
- Municipal Planning Unit (MPU): This unit facilitates and coordinates the implementation district-level development plans and oversees the monitoring and evaluation thereof.

3 METHODOLOGY

The CVA for the CCMA (EPA, 2024) adopted a hybrid methodology which focussed on the biophysical impacts of climate change while also exploring the vulnerability of different social groups, unpacking the systemic drivers of climate change vulnerability. The CVA utilised the Climate Vulnerability and Capacity Analysis tool developed by CARE International (2019) to collect and analyse vulnerability information. This information has been summarised to provide relevant context for the expanded information on vulnerable population groups as well as the results of the Preliminary Level Scorecard.

Input needed to expand on the CVA was gathered in a participatory manner, guided by the latest scientific literature on climate impacts in Cape Coast and the vulnerabilities of different population groups in the city. The same approach was adopted to gather the information needed to complete the Preliminary Level Scorecard, with input from the various stakeholders gathered in the participatory workshop forming primary input, supplemented with information from relevant literature. This participatory approach ensured that stakeholders from all different sectors represented at the workshop were able to provide input, contributing through their professional expertise and lived experiences within the city when relevant. Measures to encourage women participation were taken but insufficient to reach parity. All inputs were accounted equally to deliver results that aimed to capture a holistic understanding of the status of resilience in Cape Coast.

A participatory approach was also used to co-develop an adaptation vision for Cape Coast. The stakeholders contributed their adaptation visions, which were combined, reviewed and adjusted by all stakeholders. This led to a shared adaptation vision in line with the views of the full stakeholder group.

4 CLIMATE CHANGE HISTORY AND PROJECTED CLIMATE CHANGE

4.1 CLIMATE HISTORY

The mean annual maximum temperature in Cape Coast has shown a significant increase from 1980 to 2020 with small variability, with both day and night temperatures rising, and hot days and hot nights also showing an increasing trend. Rainfall in the city has been variable on both monthly and annual scales, and this lack of clear rainfall trends has impacted planning with no reliable long-term forecast to inform decision making. Heavy rainfall events varied annually and years that experienced more heavy rainfall events may have also had a greater number of hazards, such as floods, in the area. Wet spells decreased while dry spells increased marginally, with the shortest dry period lasting seven days while the longest dry period lasted 26 days in 2020. Cumulatively, the historic climate data in the CVA (EPA, 2024) provides strong evidence of the impacts of climate change, observed most clearly in relation to changes in temperature compared to rainfall variables.

4.2 PROJECTED CLIMATE CHANGE

The CVA (EPA, 2024) projected future climate, corresponding to 10 different combinations of General Circulation Models and Regional Climate Models, for RCP4.5 and RCP8.5 emission scenarios up to the year 2100, with a baseline period of 1980-2020.

The analysis used observational climatological data from 1980 to 2020 provided by the Ghana Meteorological Agency and model data from satellite observations. The source of model data was ERA5 for temperature-related indicators, and Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS) for rainfall-related indicators. The data was downscaled using the quantile-quantile transformation method.

It was found that temperatures are expected to rise in Cape Coast, with both annual maximum and minimum temperatures increasing over the century, with average minimum temperatures increasing the most. Rainfall patterns are anticipated to remain variable, with inter-annual and decadal variations forecast for rainfall distribution, heavy events, onset, cessation, and dry spells. The rainfall variability is projected to result in intermittent dry and wet years over Cape Coast, with mean annual rainfall ranging from 600-1,200 mm. While some years are expected to experience an early onset rainy season, others may experience delays, and dry spells are expected to become more prolonged.

5 CLIMATE HAZARDS

5.1 CURRENT CLIMATE HAZARDS

Ghana is currently affected by a variety of extreme climate events and hazards, including high temperatures, heatwaves, heavy rainfall, floods (inland and coastal), droughts, and windstorms. In Cape Coast floods constitute the highest number of extreme climatic events (71%), followed by droughts (29%; EPA, 2021). These hazards impact both natural and human systems in the city, disrupting ecosystem functioning as well as socio-economic activities.

The CVA reported that flooding presents the most prevalent risk in Cape Coast (EPA, 2024), with over 21% of the area classified as 'high flood hazard zones', particularly along the coastline and associate estuaries (Danso et al., 2020). Past floods have led to loss of life and impeded school attendance, business operation, road usage and damaged infrastructure and loss of private property. While most flood-prone areas are located in the more urbanised southern regions of Cape Coast, flooding also impacts agriculture taking place in the northern parts of the city, leading to loss of crops and livestock.

5.2 FUTURE CLIMATE HAZARDS

The IPCC Sixth Assessment Report (2023) projects that climate extreme events will increase in frequency and intensity in the near to distant future. The hazards that currently impact Cape Coast are expected to present more significant risks as their impacts worsen with climate change. As noted in the CVA, these hazards present increased risk, so their impacts on the city and its surrounding environment will worsen (EPA, 2024).

Rising temperatures present significant risk through the impact of heat, and the compounded heat risk categorization (temperature-based heat + population or temperature and humidity-based heat + population; World Bank 2024) for the Central Region shows that compound heat risk for the Cape Coast area is set to rise significantly over the next decade (Figure 3). This can lead to worsened impacts of droughts through extended duration and increased intensity. The secondary impacts associated with heat extremes are also set to worsen, with water scarcity, human health impacts and disrupted ecological functioning set to worsen.

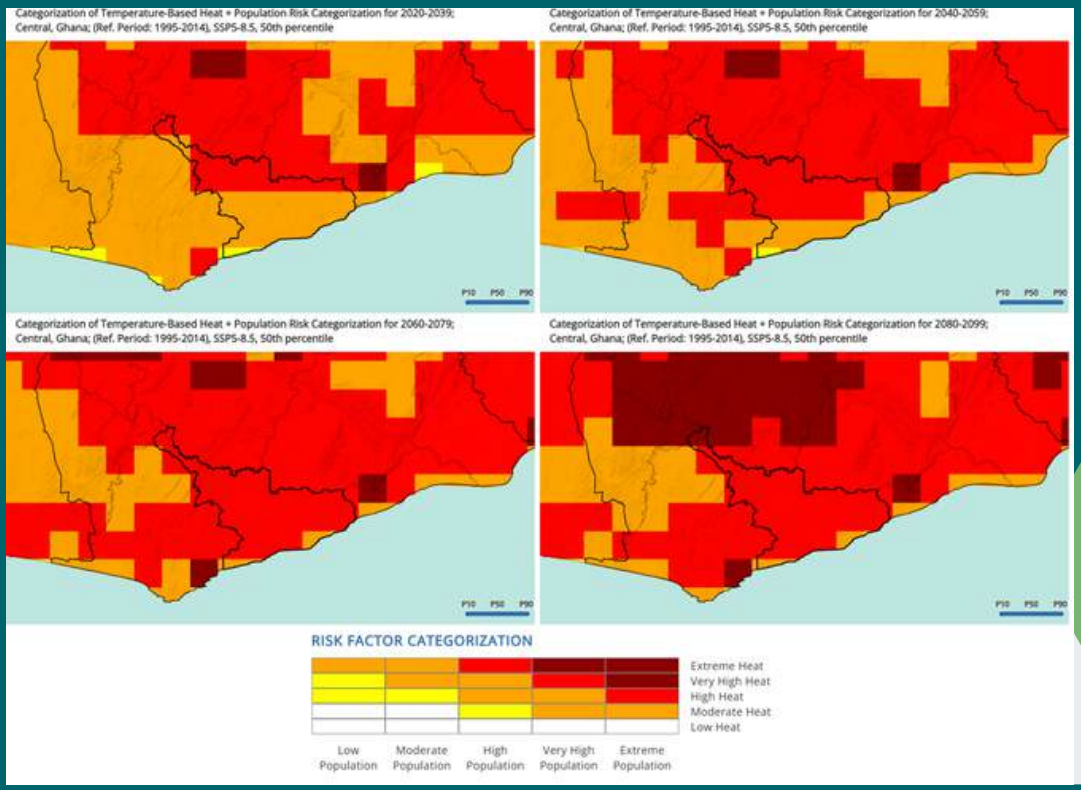


Figure 3. Compounded heat risk for the Central Region of Ghana (World Bank, 2024).

Floods are expected to occur with greater frequency, particularly in low-lying coastal areas of the city, with a high risk of urban flooding anticipated at least once every decade. Secondary impacts such as landslides will also become more prominent with increasing flood events.

Sea level rise is expected to continue globally, and this will impact the coastal parts of Cape Coast. The city's coastline being categorised as having "very high vulnerability" to future sea level rise (Boateng et al., 2017) and as the phenomenon worsens under climate change, so the impacts are expected to become more prevalent. Increased levels of saltwater intrusion, more extensive coastal erosion, and worsened coastal area flooding during storm surges are all expected as a result of increased sea level rise in Cape Coast.

6 CLIMATE HAZARD IMPACTS

6.1 SECTORAL IMPACTS

The CVA shows a broad suite of impacts from climate hazards across various sectors in Cape Coast (EPA, 2024). The impact of climate hazards is set to worsen in the future as climate change drives greater frequency and intensity, and thus the affected sectors will be placed at greater risk. Several hazards are also likely to have compounding effects if these changes lead to them occurring concurrently or in close succession. Many sectors have critical dependencies on the surrounding ecosystem, and if these hazards impact the wellbeing or functioning of the environment, the provision of ecosystem services and availability of natural resources may be hindered. The sectoral impacts identified in the CVA are summarised below:

WATER

Rising temperatures and more frequent and severe drought events will likely threaten water security in Cape Coast. The risk to water security is increased as sea level rise drives greater saltwater intrusion and contamination of groundwater during floods and storm surges. With the city having a rising demand for water, management of water resources will become more challenging, increasing risks to health, sanitation, agriculture and industrial functioning.

AGRICULTURE

The agriculture sector is vulnerable to more erratic rainfall, making planning more challenging and increasing the need for irrigation and water storage. Prolonged dry spells and higher temperatures will threaten agricultural yields, placing farmers' livelihoods at risk and jeopardising food security. Flooding impacts can lead to loss of crops, livestock and infrastructure. Floods also drive increased soil erosion and can potentially result in contamination of soil and stored water. Farms close to the coastline are particularly vulnerable to storms, erosion, and saltwater intrusion.

Fishing is also affected by erratic rainfall and storm surges, and rising sea temperatures can impact fish stocks. These changes place many livelihoods at risk and drive food insecurity and because women dominate downstream fisheries activities like processing, preservation, and marketing, they are disproportionately affected. Rising temperatures can also drive higher rates of spoilage, increasing dependence on processing and preservation, increasing food costs.

HEALTH

Increased temperatures and humidity can exacerbate health issues, placing people with cardiovascular and respiratory diseases at greater risk. Pregnant women are also vulnerable to heat risk, and people working outdoors and carrying-out intensive physical labour face greater risk of heatstroke and dehydration. Contamination of water sources during flood events presents potential health risks and can strain healthcare facilities following very severe events.

TRANSPORT

Major roads that connect Greater Accra to Western regions, located near the coastline, are at risk of damage from sea level rise and coastal flooding. This would result in significant disruptions to socio-economic functioning in the region. Damage to smaller roads and restricted access during floods can prevent delivery of emergency response services, impede local socio-economic functioning, and result in school closures.

TOURISM

Tourism in Cape Coast is dominated by coastal attractions which are placed at risk by coastal erosion and sea level rise. While protective measures have been established to safeguard some historic sites and infrastructure (Figure 4), the compound effects of sea level rise and increased intensity of storm surges may result in these measures being inadequate. Coastal erosion on beaches may hinder tourism and place livelihoods at risk if the sector declines, which will have disproportionate impacts on women who dominate the hospitality industry.

Figure 4. Protective rock revetments along the coastline in Cape Coast.

6.2 POPULATION IMPACTS

The CVA conducted a quantitative vulnerability assessment which showed varying degrees of climate vulnerability across all communities in the Cape Coast Metropolis (EPA, 2024). Coastal communities were found to be most exposed and sensitive to climate change impacts like flooding and erosion while inland areas had lower levels of exposure. Sensitivity was similarly high in coastal zones and northern communities, while adaptive capacity was lowest in areas with limited alternative incomes, climate information, and awareness. Newly developed communities with modern planning were found to have the lowest vulnerability while the highest vulnerability was present in communities exposed to flooding and erosion, especially near coastal lagoons.
To expand upon the spatial vulnerability analysis in the CVA, stakeholders at the DRR4Africa workshop assessed the magnitude of impacts of the three primary climate hazards on different population groups in Cape Coast (Table 1). High impacts were attributed to the majority of groups for all three hazards, with only a few receiving moderate or low ratings. The prevalence of high ratings highlights the widespread social impacts of these hazards across most people in the city.

Climate hazard	Population group								
	Women and girls	Children	Youth	Elderly	Marginalised groups	People living with disabilities	People with chronic diseases	Low-income households	Fisherfolk
Storms and tidal waves	3	3	1	3	1	3	1	1	3
Drought	3	3	2	3	-	3	3	2	-
Floods	3	3	1	2	3*	3	3	2	-

**Homeless people*

Table 1. Magnitude of climate hazard impacts on different population groups in Cape Coast, rated high (3), moderate (2) or low (1).

Storms and tidal waves affect women and girls through the destruction of homes. These events also place them at risk when collecting water or buying food and fuel for their households. Children are directly vulnerable to these hazards when travelling to school, and are impacted by school closures, affecting their education. The elderly were identified to be vulnerable as they can lose property and be displaced from their homes, contributing significant psychological stress. These impacts are similar for people living with disabilities, who may have their lives destabilised by the hazards and are less capable of avoiding exposure. The stakeholders also identified fisherfolk as a distinct population group with unique vulnerability to storms and tidal waves. Fisherfolk are directly exposed to high levels of physical risk if they are out at sea when these hazards manifest, and dangerous ocean conditions preventing fishing can jeopardise their livelihoods and food security. These hazards can also impact the distribution and availability for fish stocks, leading to a need to journey further to find fish which is costly and dangerous.

The impacts of droughts were predominantly high across all population groups. As women and girls typically bear the burden of collecting water for household use while also being responsible for a range of other household duties, they were allocated high impact levels as they would need to travel further and face other risks when procuring water. Women's businesses linked to agriculture, such as market stalls, may also be affected if the droughts affect crops and livestock. Children face the risk of malnutrition if droughts impact food security, stunting their development, and children are also most susceptible to water-borne diseases, exposure to which increases when water scarcity is high during droughts.

Many members of the youth in Cape Coast have economic activities linked to agriculture, which may be negatively affected by drought impacts. For both the elderly and people living with chronic diseases, the stakeholders noted increased health vulnerabilities as a potential impact of drought, due to cardiovascular and respiratory strain as well as dehydration risks. People with disabilities may face exacerbation of existing challenges during droughts, hindering their ability to engage in socio-economic activities, and they may find it difficult to secure food and water if travel distances increase due to resource scarcity. People in low-income households may face exacerbated financial challenges as the price of food and other resources rise during droughts, and dependence on refrigeration is increased.

The impacts of flooding were rated high across most population groups. Challenges to accessing fresh water for household use and contamination of stored water were noted as key impacts for women and girls. For children, flooding significantly impacts school attendance and many children are exposed to physical danger, water-borne diseases and psychological stress during flood events. Elderly people often have strong sentimental attachments to their homes and this makes relocation during floods challenging and traumatic. For both the elderly and people with disabilities, their ability to quickly evacuate is limited, placing them at significant physical risk. Floods can restrict access to medical facilities and pharmacies, significantly impacting the wellbeing of people with chronic diseases, and adding additional stress. For low-income households, poverty can be exacerbated by loss of property and homes, and limited road access threatening their livelihoods, and resulting in prolonged recovery periods post-disaster for these people. The stakeholders also identified homeless people as a population group with unique vulnerability to flood impacts, as they do not have shelter to protect them during these events, and flood exposure may lead to or worsen health conditions and jeopardize their livelihoods, significantly increasing their vulnerability.

7 SCORECARD RESULTS

7.1 CITY GOVERNANCE

Essential 1: Organize for Resilience

In Cape Coast, more development is needed to put in place an organisational structure to act on reducing disaster risks. The city benefits from hosting a regional NADMO office, facilitating collaboration on DRR. The city has a Medium-Term Development Plan (MTDP) which aligns with the National Development Planning Commission (NDPC) guidelines for plan preparation. The MTDP covers planning and implementation for disaster prevention and mitigation, sensitisation on disaster risk prevention, early warnings, and data gathering on DRR, all aligned with actions of NADMO. The city undertakes resilience actions, but these are not effectively coordinated, and planning remains largely reactive. A greater emphasis on building future resilience of critical infrastructure and city functions is needed. This should be informed by up-to-date risk information, the foundation for which can be drawn from the EPA's recently completed CVA for the city. Working collaboratively with NADMO, the city can ensure the requisite steps for effective DRR are taken across all city functions.

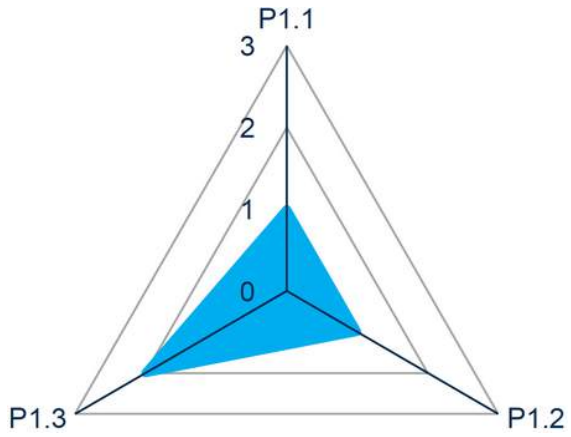


Figure 5. Essential 1 scorecard results.

Essential 2: Identify, Understand and Use Current and Future Risk Scenarios

There is functional understanding of risks in the city, but more robust scenarios need to be developed as much of the current understanding is drawn from past disaster events. The CVA recently developed by the EPA captures information on key hazards, but the city needs to take ownership for future updates and data collection There also needs to be a focus on understanding future risks to inform preemptive actions. Data collection needs to be strengthened to ensure that the scenarios are reliable and can account for cascading impacts in the city. The understanding of roles and responsibilities between the city, utilities and other agencies is well developed and a collaborative approach to DRR is well established. Utilities undertake basic risk avoidance actions, and the city attends regular Municipal Planning Coordinating Unit (MPCU) and Spatial Planning Committee (SPC) meetings. NADMO publishes quarterly reports that inform the city's Annual progress Reports and Disaster Implementation Report.

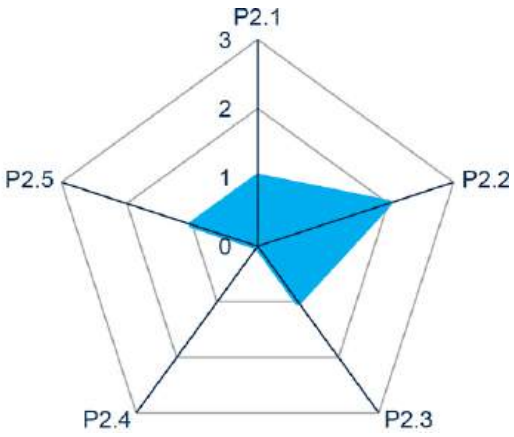


Figure 6. Essential 2 scorecard results.

Essential 3: Strengthen Financial Capacity for Resilience

The assessment found that there is a significant need to improve understanding of the economic impact of disasters and the need for investment in resilience. Cape Coast will need to identify and develop financial mechanisms that can support resilience activities. Capacity development will be needed, leveraging the city's partnerships and collaborating with the national government, to ensure that financial management in the city adopts a resilience planning approach while still being able to meet the financial needs of other city functions. External funding could be sought out to seed this process. The insurance sector needs to be engaged to incentivise insurance for disasters across the city.

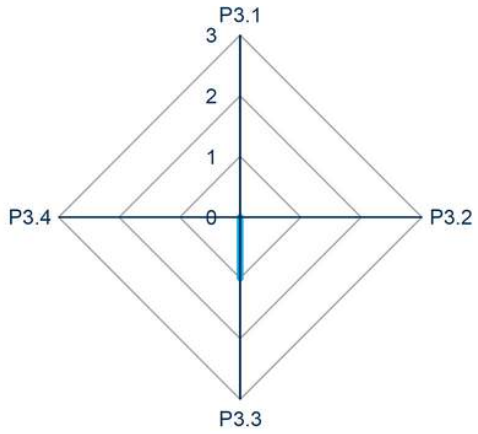


Figure 7. Essential 3 scorecard results.

7.2 INTEGRATED PLANNING

Essential 4: Pursue Resilient Urban Development

The city has building codes in and standards in place, but these need to be informed by more up-to-date hazard information. Zoning in Cape Coast also needs to be guided by hazard information. The CVA developed by the EPA will be a key starting point for this, as it can inform future zoning and the review of building codes and standards. Systems to improve the updating and enforcement of these can then be developed further. The city is involved in SPC committee meetings which take place to discuss zoning and other development considerations, and so there is opportunity to mainstream resilience through these processes.

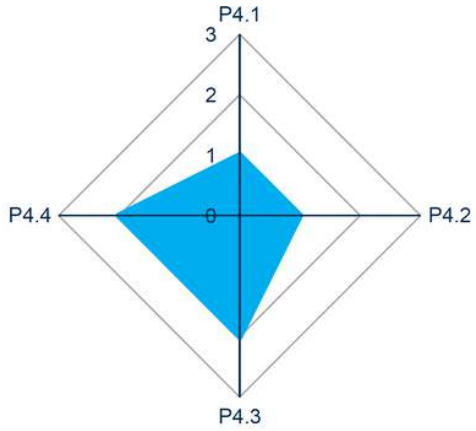


Figure 8. Essential 4 scorecard results.

Essential 5: Safeguard Natural Buffers to Enhance the Protective Functions Offered by Natural Ecosystems

Significant improvements can be made to the city's efforts to safeguard its natural disaster buffers. Awareness of natural buffers and ecosystem services is limited. The city must identify, protect and monitor critical ecosystem services that provide a disaster resilience benefit. Mainstreaming of green and blue infrastructure is also needed, with the city's coastal location providing opportunities for both to become key components of resilience in Cape Coast.

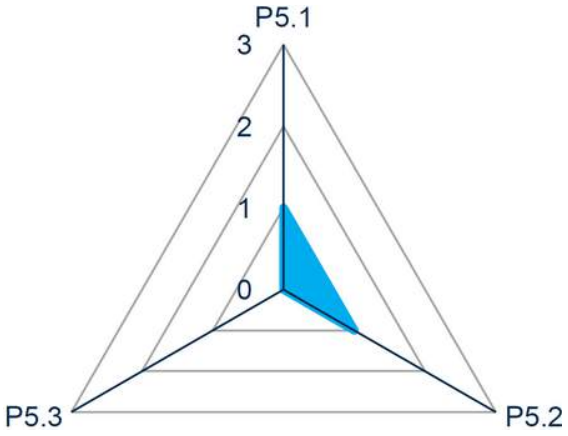


Figure 9. Essential 5 scorecard results.

Essential 6: Strengthen Institutional Capacity for Resilience

The assessment found that skills and experience for effective DRR are present in Cape Coast and there is a strong system for information dissemination to the public, including radio, television and social media, in a way that is understandable. Disaster volunteer groups and Rapid Response teams are also present to engage the public. Data collection and sharing can be improved between the city and other relevant DRR agencies. There is also a need to ensure more training materials are developed and are translated for accessibility.

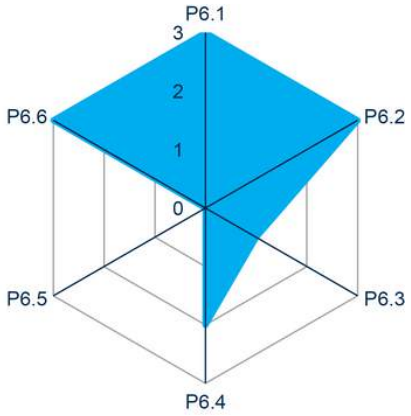


Figure 10. Essential 6 scorecard results.

Essential 7: Understand and Strengthen Societal Capacity for Resilience

Citizen engagement and communication is strong in Cape Coast. The participation of community organisations in DRR processes can be improved through more regular involvement and collaboration. Training programmes can be expanded upon to account for the most up-to-date scenarios as well as to prepare for future hazard impacts. The private sector should be engaged to develop continuity plans, guided by DRR information from the city. These steps should greatly improve the leveraging of societal capacity in Cape Coast.

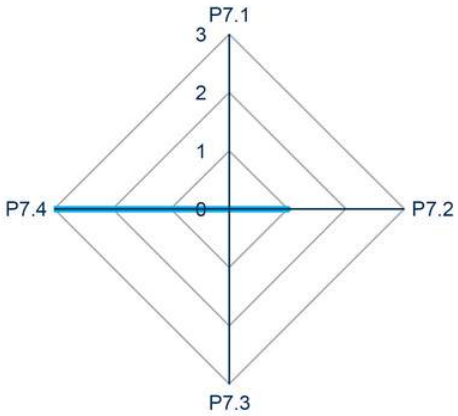


Figure 11. Essential 7 scorecard results.

Essential 8: Increase Infrastructure Resilience

The assessment found significant vulnerability of critical infrastructure systems in Cape Coast, stemming from a lack of hazard information and disaster scenarios that would inform resilience measures. Protective infrastructure is needed, particularly along the coastline, and critical infrastructure and utilities require upgrading or retrofitting to ensure resilience to expected hazards. Road infrastructure is key in this, as access to all communities needs to be maintained for emergency response and relief efforts. There are several healthcare facilities in the city, and access to these during disasters needs to be ensured through a resilient road network. The city has strong connections with the relevant agencies, these can be leveraged for action to address these needs.

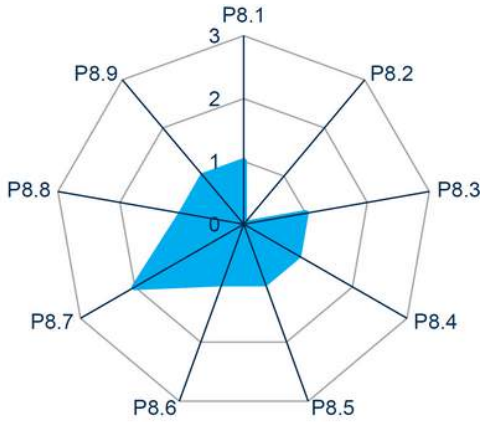


Figure 12. Essential 8 scorecard results.

7.3 RESPONSE PLANNING

Essential 9: Ensure Effective Disaster Response

Disaster response in Cape Coast was found to be relatively strong, with the presence of the regional NADMO office being key to this. There are opportunities to improve early warnings and forecasting as well as public preparedness through drills. The development of disaster scenarios will be useful for ensuring any drills carried out account for variability.

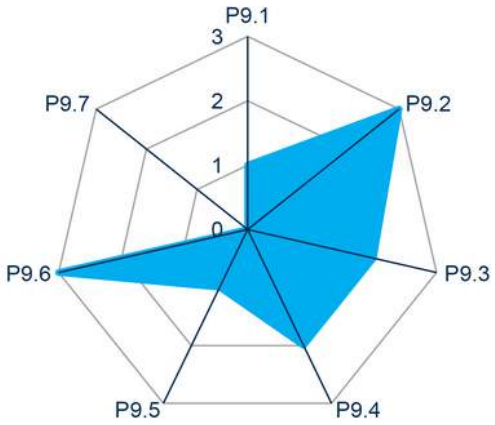


Figure 13. Essential 9 scorecard results.

Essential 10: Expedite Recovery and Build Back Better

Recovery efforts in Cape Coast are well established to address short-term needs but could be developed to account for long-term economic recovery and building back better through mainstreaming of DRR. There is also a need to increase focus on capturing lessons learnt for improved preparedness and response. Post-event data capture does already take place, this can be scaled into a more thorough process to ensure key data is monitored for improved resilience in the city.

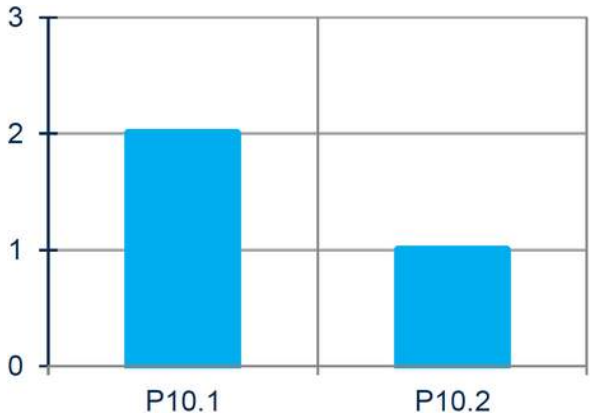


Figure 14. Essential 10 scorecard results.

7.4 FINAL CITY SCORE

Cape Coast has a mixed resilience profile, with several key strengths that present opportunities to address critical challenges. The city benefits from hosting regional offices of key agencies, specifically NADMO, which facilitates strong collaboration and effective planning. However, the coordination of resilience actions and mainstreaming of disaster preparedness within city functions requires attention. There are opportunities to better leverage the city's natural assets and societal capacity to improve resilience, and this needs to be met with improving resilience of critical infrastructure across the city.

The city has taken key steps to address resilience needs, with numerous partnerships present that can facilitate capacity building and unlocking critical funds for DRR interventions. The city also benefits from the presence of a newly developed CVA by the EPA which can be used to inform planning and guide decision making by taking the city's key hazards into consideration. Through mainstreaming of DRR into city planning, informed by a growing evidence base, Cape Coast's journey to resilience can build upon the foundational element in place to benefit the people of the city, ensuring their wellbeing and safeguarding the city's socioeconomic functioning.

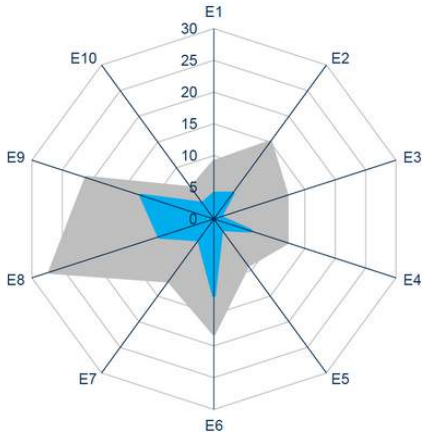


Figure 15. Cape Coast overall scorecard results.

8 ADAPTATION VISION AND ACTIONS

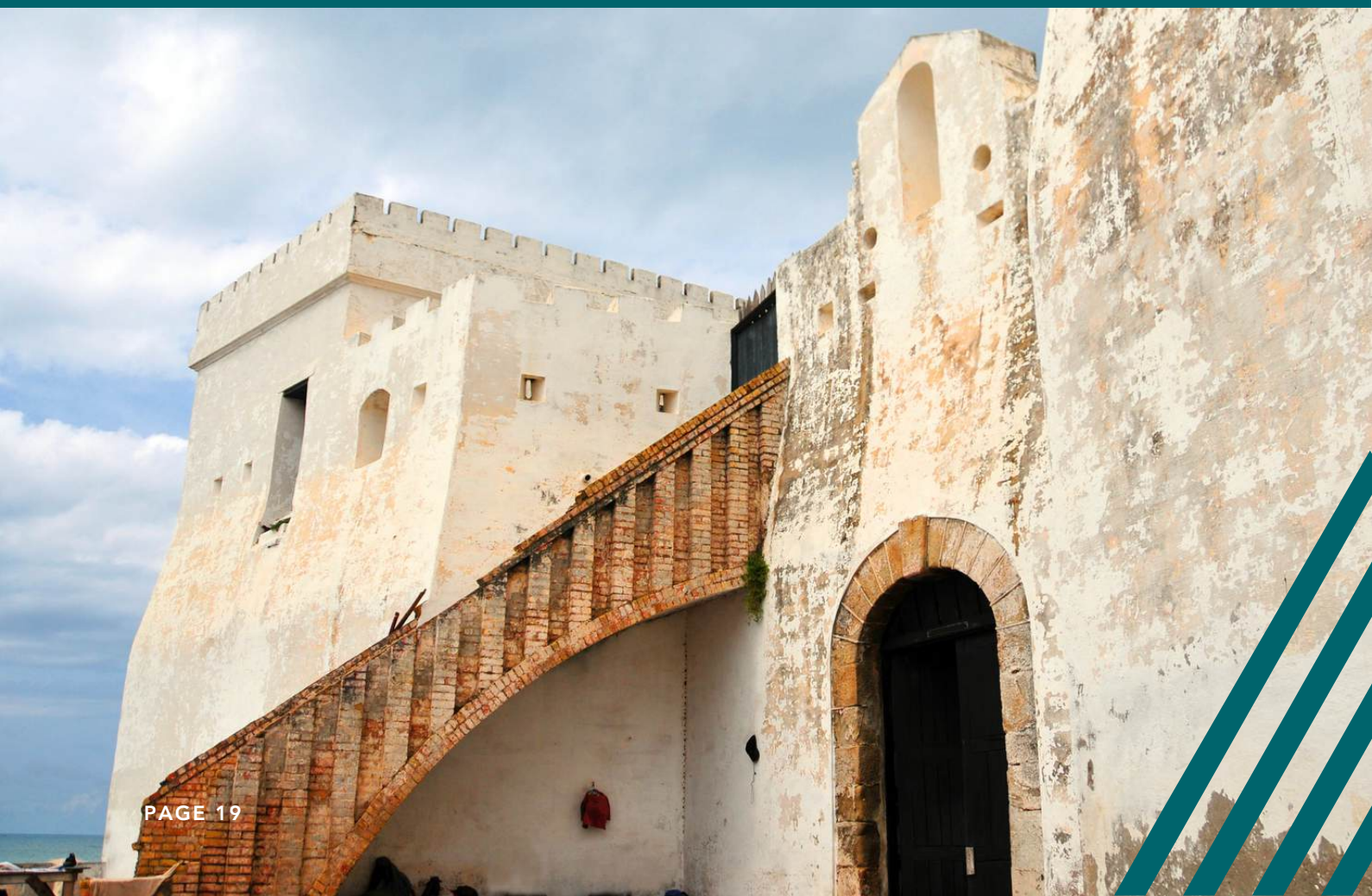
The stakeholders proposed an adaptation vision for the city of Cape Coast, which could be used for aligning future adaptation actions. There was deliberation over the proposed vision, with various suggestions presented that included concepts of capacity for DRR, and some that highlighted key sectors that could be part of the vision. Through the discussions, the stakeholders found it critical to mention that the city is coastal, as this presents a unique set of challenges and opportunities that must be addressed and harnessed by adaptation actions. The need for resilience and sustainability was also prominent in the suggestions, and stakeholders noted that inclusivity was a vital aspect. The final adaptation vision was reached through consensus of all the stakeholder as:

By 2030, Cape Coast will be a resilient coastal city with an advanced capacity to prevent and manage disasters and develop sustainable livelihoods for all its people.

The stakeholders developed indicative adaptation actions aligned with the new adaptation vision for the city. These actions were designed to meet priority needs in Cape Coast and form the basis of potential project concepts for future funding pursuits and programme developments. The following three adaptation actions were developed by the stakeholders:

1. Expansion of ocean buffer zones with coastal defence infrastructure to mitigate the impacts of tidal waves and coastal storms. This would safeguard coastal ecosystems and infrastructure.
2. Improving agricultural irrigation and water storage in preparation for future rainfall variability. This would be accompanied by a significant awareness raising and collaborative capacity building effort with farmers and farming communities.

Development of roadside drainage systems to reduce flood impacts. The project was envisaged to cover 5 km of roads in the heart of the metropolis where past flood impacts have been severe.



9 CONCLUSION

The city of Cape Coast is a key coastal hub of socio-economic infrastructure and services in the Central region of Ghana, while also hosting a significant fishing sector as well as terrestrial agriculture. The city also has a growing tourism sector that holds potential for sustainable economic growth that could provide livelihoods for many women and youths. These livelihoods are currently impacted by the effects of several climate hazards, particularly floods, storm surges and tidal waves, as well as droughts. Climate change is projected to drive the frequency and severity of these hazards to increase over the next decade, these impacts are likely to worsen and place a growing number of people in the city at risk.

The city currently has a resilience profile with some important strengths, such as a strong relationship with NADMO, prioritisation of DRR in city planning and development, strong partnerships, and a recent CVA developed through Ghana's NAP process. There is a need for improved disaster preparedness across the city and critical infrastructure requires intervention for improved resilience. The city has important natural assets and societal capacity that can be better leveraged in the process of improving overall resilience. Key sectors, such as fishing and tourism, will require focused efforts to ensure that critical livelihoods are safeguarded. Vulnerable population groups will also need to be involved in future planning and decision-making so that the actions taken also serve to protect their wellbeing and reduce their vulnerability to climate hazards.

While there is national policy in place that supports resilience and adaptation actions, the local-level strategies and plans must be strengthened, and funding and resources are needed for implementation. The vision of Cape Coast as a 'resilient coastal city with an advanced capacity to prevent and manage disasters and develop sustainable livelihoods for all its people' can be achieved through effective action, but the city will need to leverage partnerships and innovative measures to unlock implementation while engaging the national government for expanded DRR support. The strong awareness and commitment to improved resilience and embracing adaptation within the city holds potential for impactful action to benefit the city and its people.

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