



Strengthening Investments
in Gender-Responsive
Climate Adaptation



Costed Adaptation Plan

AUGUST 2026

KUMBUNGU DISTRICT



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LIST OF ACRONYMS

AAP	Annual Action Plan
BAC	Business Advisory Centre
BOQs	Bill of Quantities
CAP	Climate Adaptation Plan
CRVA	Climate Risk and Vulnerability Assessment
CSA	Climate-Smart Agriculture
CSIR	Council for Scientific and Industrial Research
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
CWSA	Community Water and Sanitation Agency
DACF	District Assemblies Common Fund
DPCU	District Planning Coordinating Unit
EHSU	Environmental Health and Sanitation Unit
EPA	Environmental Protection Agency
FBO	Farmer-Based Organisation
GCF	Green Climate Fund
GEA	Ghana Enterprise Agency
GEF	Global Environment Facility
GHS	Ghana Cedis / Ghana Health Service (context dependent)
GIDA	Ghana Irrigation Development Authority
GMet	Ghana Meteorological Agency
IGF	Internally Generated Funds
MCA	Multi-Criteria Analysis
MEL	Monitoring, Evaluation and Learning
MESTI	Ministry of Environment, Science, Technology and Innovation
MoFA	Ministry of Food and Agriculture
MoGCSP	Ministry of Gender, Children and Social Protection
MTDP	Medium-Term Development Plan
NADMO	National Disaster Management Organisation
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organisation
O&M	Operations and Maintenance
PPP	Public–Private Partnership
PWD	Person with Disabilities
SARI	Savanna Agricultural Research Institute
SIGRA	Strengthening Investments in Gender Responsive Climate Adaptation
TVET	Technical and Vocational Education and Training
UNICEF	United Nations Children's Fund
VSLA	Village Savings and Loans Association
WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation
WHO	World Health Organisation
WRC	Water Resources Commission
WSMT	Water and Sanitation Management Team

EXECUTIVE SUMMARY

The Kumbungu District Costed Climate Adaptation Plan (CAP) provides a strategic and investment-oriented framework for reducing climate vulnerability and strengthening resilience across the district. It translates the findings of the Kumbungu Climate Risk and Vulnerability Assessment (CRVA) into prioritised, costed, and implementable adaptation investments. The CAP was developed through a participatory process involving the Kumbungu District Assembly, decentralised departments and agencies, traditional authorities, community representatives, women, youth, persons with disabilities, and other relevant stakeholders under the Strengthening Investments in Gender-Responsive Climate Adaptation (SIGRA) Project, implemented by Cowater International.

The Plan prioritises **15 adaptation actions across five sectors: Agriculture, Infrastructure, Health, Water Resources, and Gender and Social Inclusion**. The total indicative investment requirement is **GHS 34,005,000**. Cost estimates cover an initial three-year planning and implementation period, although some capital-intensive infrastructure investments will require longer preparation and implementation horizons.

Ch. 1 Purpose, Scope and Use of the Costed Adaptation Plan

Chapter 1 establishes the rationale, purpose, scope, and intended use of the CAP. Kumbungu District is increasingly affected by recurrent flooding, prolonged dry spells, water scarcity, environmental degradation, extreme temperatures, and climate-sensitive health risks. These hazards affect livelihoods, infrastructure, public services, and the wellbeing of vulnerable populations, particularly women, children, persons with disabilities, smallholder farmers, and low-income households.

The chapter explains how the CAP bridges the gap between climate risk assessment and practical implementation. While the CRVA identified priority hazards, exposed sectors, vulnerable communities, and affected population groups, the CAP determines which adaptation actions should be implemented, their indicative costs, institutional responsibilities, implementation timeframes, and potential financing pathways.

The Plan is aligned with Ghana's National Adaptation Plan, Nationally Determined Contribution (NDC), the SIGRA Project framework, and district planning and budgeting instruments, including the Medium-Term Development Plan, Annual Action Plans (AAPs), Composite Budgets, and sector work programmes. It is intended to support strategic prioritisation, budgeting, resource mobilisation, implementation coordination, accountability, and institutional learning.

Ch. 2 Climate Risks and Priority Adaptation Needs

Chapter 2 synthesises the decision-relevant findings of the Kumbungu CRVA. The principal climate-related hazards affecting the district are drought, flooding, water scarcity, bushfires, and pests and diseases. These hazards interact with high dependence on rain-fed agriculture, inadequate irrigation infrastructure, environmental degradation, poverty, and limited access to climate information and financial services.

The chapter identifies Agriculture, Infrastructure, Health, and Water Resources as the principal climate-sensitive sectors, while Gender and Social Inclusion is treated as a cross-cutting priority. Agriculture is affected by drought, flooding, extreme heat, windstorms, bushfires, and changing pest and disease patterns. Infrastructure is increasingly damaged by flooding, erosion, and windstorms. Public health risks are intensified by water contamination, poor sanitation, malaria, heat stress, and disruptions to health services. Water resources are threatened by prolonged dry periods, declining availability, and contamination during floods.

Priority climate-risk hotspots include **Nawuni, Apayili, Zuggu, Kpalsogun, Gbullung/Gbullungkuli, and Bognaayili**. Women, smallholder farmers, youth, migrants, older persons, pregnant women, nursing mothers, and persons with disabilities were identified as particularly vulnerable because of their

exposure, livelihood dependence, mobility constraints, and limited access to productive resources and adaptation support.

The chapter highlights five principal investment implications: strengthening drought resilience and water security; investing in climate-smart agriculture; improving flood-resilient infrastructure; enhancing climate-sensitive health and sanitation services; and promoting livelihood diversification and targeted support for vulnerable groups.

Ch. 3 Adaptation Prioritisation Process and Learning Outcomes

Chapter 3 describes the participatory and evidence-based process used to identify, assess, and rank adaptation options. The process drew on four principal sources: findings from the CRVA; technical knowledge from district departments and decentralised agencies; community experiences and stakeholder perspectives; and structured prioritisation tools.

Potential adaptation actions were first identified through sector-based longlisting and screening. Participants then assessed shortlisted options using a Multi-Criteria Analysis (MCA) based on six criteria:

- Relevance to identified climate risks and vulnerabilities;
- Expected resilience impact;
- Technical and institutional feasibility;
- Long-term sustainability;
- Gender and social inclusion; and
- Institutional fit.

The criteria were weighted to reflect district priorities, with relevance and impact receiving the highest weights. Sector groups subsequently selected and ranked three priority actions for each of the five sectors.

The chapter also documents the learning and institutional capacity gains generated through the process. District stakeholders strengthened their ability to translate climate risks into implementable actions, apply MCA tools, assess trade-offs, integrate gender and social inclusion considerations, identify implementation responsibilities, and connect adaptation priorities to planning and budgeting processes.

A second participatory workshop translated the ranked actions into detailed investment packages through activity-based costing, economic appraisal, operations and maintenance assessment, financing analysis, and implementation planning.

Ch. 4 Costed Priority Adaptation Actions

Chapter 4 is the operational core of the CAP. It presents the 15 prioritised adaptation investments, including project descriptions, objectives, indicators of success, primary beneficiaries, timeframes, resource requirements, lead and collaborating institutions, estimated costs, and potential financing sources.

Agriculture — 3 actions; GHS 5,259,000

The Agriculture investment portfolio includes:

1. Climate-Smart Agriculture Training and Extension — establishment of 10 demonstration farms and training of approximately 1,000 farmers in climate-smart agriculture, agroforestry, soil and water conservation, pest and disease management, and climate information use.
2. Small-Scale Irrigation Development and Water Management — development or rehabilitation of five community irrigation schemes, solar-powered pumping systems, water storage facilities, and 20 keyhole gardens.
3. Agro-processing and Agricultural Value Chain Support — establishment or strengthening of 20 Village Savings and Loans Associations, business development support, improved access to finance and markets, and promotion of women-led agro-processing enterprises.

These investments seek to reduce dependence on rain-fed farming, improve agricultural productivity, minimise post-harvest losses, and strengthen the resilience of women, youth, and smallholder farmers.

Infrastructure — 3 actions; GHS 22,000,000

The Infrastructure portfolio includes:

1. Flood Embankments and Flood Protection Infrastructure — construction and rehabilitation of protective structures in Nawuni, Apayili, Zuggu, and other flood-prone locations.
2. Climate-Proof Roads and Market Access Infrastructure — climate-proofing of five feeder roads and construction or rehabilitation of 10 culverts.
3. Drainage Rehabilitation and Improvement — rehabilitation, expansion, and maintenance of drainage systems in flood-prone settlements.

Infrastructure accounts for approximately **65% of the total CAP investment**, reflecting the substantial capital requirements associated with flood protection, transport infrastructure, and drainage systems.

Health — 3 actions; GHS 2,056,000

The Health investment portfolio includes:

1. Hygiene and Environmental Health Promotion Campaigns — quarterly campaigns across 12 climate-vulnerable communities.
2. Community-Based Malaria and Disease Control Programme — malaria prevention activities in 15 high-risk communities, including the distribution of approximately 1,000 insecticide-treated mosquito nets.
3. Climate-Sensitive Disease Surveillance and Community Health Outreach — strengthened surveillance, risk communication, early warning, and outreach services in 12 vulnerable communities.

These interventions focus on prevention, early detection, community preparedness, and improved access to climate-sensitive health services.

Water Resources — 3 actions; GHS 2,453,000

The Water Resources portfolio includes:

1. Construction and Rehabilitation of Boreholes — construction of five new boreholes, rehabilitation of five existing boreholes, and establishment of 10 community water-management structures.
2. Rainwater Harvesting Systems — installation of 20 complete rainwater harvesting systems for selected households, schools, health facilities, and community institutions.
3. Community Water Resource Protection and Management — establishment or strengthening of 12 WATSAN Committees, protection of catchments and recharge areas, water-quality monitoring, and community awareness.

These investments seek to improve reliable access to safe water, reduce the burden of water collection on women and girls, and strengthen the sustainability of community water systems.

Gender and Social Inclusion — 3 actions; GHS 2,237,000

The Gender and Social Inclusion portfolio includes:

1. Support for Women-Led Cooperatives and Climate-Resilient Enterprises — support for 10 women-led cooperatives engaged in shea processing, agro-processing, and other resilient enterprises.
2. Green Skills and Climate Livelihood Training — 10 vocational training programmes for approximately 300 youth and women, supported by five demonstration farms and a district-wide mentorship programme.
3. Alternative Livelihood Development — establishment of five community-based briquette production enterprises managed by organised women's or youth groups.

These investments seek to strengthen economic empowerment, diversify livelihoods, improve employability, and ensure that vulnerable groups participate in and benefit from adaptation investments.

Summary of Investment Requirements

Sector	Priority Actions	Estimated Cost (GHS)	Share of Total
Agriculture	3	5,259,000	15.5
Infrastructure	3	22,000,000	64.7
Health	3	2,056,000	6.0
Water Resources	3	2,453,000	7.2
Gender and Social Inclusion	3	2,237,000	6.6
Total	15	34,005,000	100%

Successful implementation will require phased financing, strong institutional coordination, integration into district planning and budgeting processes, and sustained partnerships with government agencies, development partners, the private sector, and local communities.

The chapter also presents a rapid economic appraisal, operations and maintenance requirements, financing considerations, and implementation phasing. The appraisal indicates that all 15 investments are expected to generate positive resilience benefits. Infrastructure investments require the highest initial expenditure but are expected to generate substantial long-term benefits through avoided damage, improved connectivity, and protection of public assets and livelihoods.

Ch. 5 Financing and Resource Mobilisation

Chapter 5 presents the financing and resource mobilisation framework for implementing the CAP. It recognises that the total investment requirement exceeds the routine financial capacity of the District Assembly and cannot be financed from a single source.

Potential financing sources include:

- District Assemblies Common Fund;
- Internally Generated Funds;
- National sector programmes;
- Government agencies such as Ministry of Food and Agriculture, Ghana Irrigation Development Authority, Community Water and Sanitation Agency, and the Ghana Health Service (GHS);
- Development partners and non-governmental organisations;
- International climate finance mechanisms, including the Green Climate Fund, Adaptation Fund, and Global Environment Facility;
- Private-sector and public-private partnerships; and
- Community contributions in the form of labour, local materials, land, maintenance, and monitoring support.

The financing strategy recommends phased and blended financing. Lower-cost, high-impact interventions should be initiated through existing district budgets, sector programmes, and partnerships. Medium-scale investments should combine district, national, and development-partner resources, while large infrastructure projects should be developed into investment-ready proposals for national programmes and external climate finance.

The chapter proposes a three-tier investment strategy:

- **Tier 1:** Immediate, lower-cost actions that can be implemented through existing resources and programmes;
- **Tier 2:** Moderately capital-intensive actions requiring co-financing and partnerships; and

- **Tier 3:** Strategic infrastructure projects requiring technical studies, detailed designs, and substantial external financing.

It also identifies financing risks, including over-reliance on external funding, weak project preparation capacity, inadequate local financing, fragmented institutional coordination, and insufficient operations and maintenance funding.

Ch. 6 Implementation, Monitoring and Governance Arrangements

Chapter 6 establishes the institutional, monitoring, evaluation, learning, and governance arrangements required to implement the CAP. Implementation is structured around three phases:

- **Phase 1 — Years 1–2:** Quick-win interventions, capacity strengthening, community-based adaptation, and integration into district plans and budgets;
- **Phase 2 — Years 2–3:** Expansion of sector interventions and implementation of medium-scale investments; and
- **Phase 3 — Years 3–5 and beyond:** Major infrastructure investments, scaling of successful actions, and consolidation of lessons.

The District Planning Coordinating Unit is proposed as the principal coordination platform, supported by the Finance Department, Department of Agriculture, Works Department, Environmental Health Unit, District Health Directorate, Community Development and Gender Desk Units, water and sanitation structures, sector agencies, development partners, and community institutions.

The monitoring framework covers four levels: activities, outputs, outcomes, and overall portfolio performance. Core indicators relate to implementation progress, financial utilisation, infrastructure and service delivery, gender and social inclusion, institutional performance, and changes in livelihood and resilience outcomes.

The chapter proposes a mid-term review at the end of Year 2 and an end-of-plan evaluation at the conclusion of the initial three-year implementation cycle. Evaluation criteria include relevance, effectiveness, efficiency, equity and inclusion, sustainability, and scalability.

Monitoring, evaluation, and learning findings are intended to support adaptive management by informing revisions to work plans, implementation schedules, investment priorities, resource allocations, and intervention designs. Gender and social inclusion remain cross-cutting requirements throughout implementation, monitoring, reporting, and learning.

Ch. 7 Conclusion, Way Forward and Recommendations

Chapter 7 concludes that climate change is already affecting livelihoods, agricultural productivity, infrastructure, water resources, public health, and local development in Kumbungu District. The CAP provides a structured transition from climate-risk assessment to an implementable and investment-ready adaptation portfolio.

The way forward focuses on five strategic priorities:

1. Mainstreaming CAP actions into district plans, budgets, and sector work programmes;
2. Initiating lower-cost, high-impact interventions while preparing larger projects;
3. Strengthening resource mobilisation and partnership development;
4. Undertaking feasibility studies, engineering designs, Bills of Quantities, environmental assessments, and detailed project preparation for strategic infrastructure investments; and
5. Sustaining institutional coordination, monitoring, learning, and adaptive management.

The chapter recommends increased district financing through DACF and IGF, stronger cross-sector coordination, continued prioritisation of gender-responsive and inclusive adaptation, enhanced capacity for project preparation and climate finance mobilisation, and regular monitoring and review of implementation.

1. PURPOSE, SCOPE AND USE OF THIS COSTED ADAPTATION PLAN

1.1 Background and Rationale

The Kumbungu District in Ghana's Northern region is increasingly experiencing the impacts of climate variability and change, manifested through recurrent flooding, prolonged dry spells, water scarcity, environmental degradation, and climate-sensitive health risks. These hazards disproportionately affect livelihoods, infrastructure, service delivery, and the wellbeing of vulnerable groups including women, children, persons with disabilities (PWDs), smallholder farmers, and the poor.

In response to these challenges, the Kumbungu District Climate Risk and Vulnerability Assessment (CRVA) was undertaken to systematically identify priority climate hazards, exposed sectors, vulnerable populations, and geographic hotspots. (Available here: <https://sigraghana.org/resources/>).

While the CRVA provided a strong evidence base for understanding climate risks, it did not on its own provide guidance on which adaptation actions should be implemented first, how much they would cost, or how they could be integrated into district planning and budgeting systems.

This Costed Adaptation Plan (CAP) was therefore developed to bridge the gap between risk assessment and practical implementation. It translates the CRVA findings and stakeholder priorities into clearly defined, prioritised, and costed adaptation actions that can be realistically implemented by the District Assembly and its partners.

Specifically, the CAP seeks to:

- Move adaptation planning from conceptual recommendations to investment-ready actions;
- Support evidence-based allocation of limited district resources;
- Strengthen institutional capacity for costing, planning, and implementation of climate adaptation measures; and
- Enhance accountability, transparency, and coordination in climate-related decision-making.

This CAP represents a deliberate step towards mainstreaming climate adaptation into routine district development planning, rather than treating it as a stand-alone or externally driven agenda.

1.2 Linkages to the CRVA and District Planning Cycles

This CAP is embedded within, and aligned to, three interrelated processes: the Kumbungu CRVA, Ghana's National Adaptation Plan (NAP), the Strengthening Investments in Gender-Responsive Climate Adaptation (SIGRA) project framework being implemented by Cowater Ghana LBG, and Ghana's district planning and budgeting cycles. These frameworks provide the evidence base, policy direction, implementation approach, and institutional mechanisms required to translate climate adaptation priorities into practical, costed, and implementable investments at the district level.

1.2.1 Linkage to the Kumbungu CRVA

The CRVA provided the foundational evidence that informed this CAP. Key linkages include:

- Identification of dominant climate hazards (e.g., flooding, drought, heat stress);
- Mapping of vulnerable sectors and communities;
- Analysis of differential vulnerability across gender, age, disability, and livelihoods.

All adaptation actions prioritised and costed in this CAP are explicitly linked to risks and vulnerabilities identified in the Kumbungu CRVA, ensuring coherence between assessment and action.

1.2.2 Linkages to the National Adaptation Plan

This CAP contributes to the implementation of Ghana's National Adaptation Plan (see NAP 2025-2030 strategy here: <https://sigraghana.org/resources/>) which seeks to strengthen climate resilience, reduce vulnerability, and integrate adaptation into national and local development planning processes. The priority adaptation actions identified for Kumbungu District align with several NAP priority areas, including climate-resilient agriculture, water security, resilient infrastructure, public health, ecosystem sustainability, and gender-responsive adaptation. By translating national adaptation priorities into district-specific investments and implementation actions, the CAP serves as a practical mechanism for localising the NAP and supporting Ghana's broader climate resilience objectives.

1.2.3 Alignment with the SIGRA Project

The CAP was developed under the SIGRA project which aims to support districts to move beyond climate diagnostics toward gender-responsive, costed, and implementable adaptation planning.

The CAP reflects SIGRA's core principles by:

- Applying participatory and inclusive prioritisation processes;
- Embedding gender and social inclusion as explicit criteria in decision-making;
- Building district-level capacity in costing, appraisal, and implementation planning; and
- Producing outputs that are directly usable for budgeting, proposal development, and investment mobilisation.

1.2.4 Integration with District Planning and Budgeting Cycles

The CAP is intentionally designed to support and complement existing district planning instruments, including:

- Medium-Term Development Plans (MTDPs),
- Annual Action Plans,
- Composite Budgets, and
- Sectoral investment plans.

Rather than creating parallel planning processes, the CAP provides climate-informed inputs that can be mainstreamed into these instruments.

1.3 Intended Users of this CAP

This document is designed as a practical working tool, not merely a policy reference. It is intended for a broad range of users involved in planning, financing, and implementing development actions in the Kumbungu District.

Table 1: Primary users and how they are expected to use the CAP

User Group	Intended Use
District Planning Officers	Integrate costed adaptation actions into MTDPs and Annual Action Plans
Budget and Finance Officers	Inform budget preparation, costing assumptions, and funding prioritisation
Engineers and Works Departments	Support design, costing, and supervision of climate-resilient infrastructure
Sector Heads (Health, Agriculture, WASH, Gender, NADMO)	Guide sector-specific adaptation programming and coordination
Assembly Members and Management	Support informed decision-making and resource allocation
Development partners and NGOs	Identify priority investment areas and partnership opportunities
SIGRA and national stakeholders	Monitor implementation progress and support scaling

1.4 Scope and Coverage of this CAP

The CAP focuses on priority adaptation actions identified through participatory processes across key climate-sensitive sectors, including:

- Agricultural Sector;
- Infrastructure Sector;
- Health Sector;
- Water Resources Sector; and
- Gender and Social Inclusion.

For each priority action, the Plan provides:

- A clear description of the intervention;
- The climate risk addressed;
- Target locations and beneficiary groups;
- Institutional roles and partnerships;
- An indicative cost breakdown; and
- A proposed implementation timeline.

The CAP does not replace detailed engineering designs or Bills of Quantities (BoQs), but rather provides credible, decision-ready estimates that can be refined during detailed project preparation.

1.5 How this CAP Plan Should Be Used

This CAP is intended to serve multiple interconnected functions across the adaptation planning and implementation cycle:

1. Strategic Prioritisation: Helping the District Assembly decide *what to do first, what can wait, and why*.
2. Budgeting and Resource Allocation: Providing indicative cost figures that support realistic budgeting and investment planning.
3. Capacity Building: Strengthening district staff understanding of costing, appraisal, and climate-responsive planning.
4. Coordination and Accountability: Clarifying institutional responsibilities, partnerships, and safeguards.
5. Learning and Iteration: Serving as a living document that can be updated as implementation lessons, costs, and climate risks evolve.

This chapter has established the purpose, scope, and intended use of the Costed Climate Adaptation Plan, clarifying its role as the implementation framework that translates climate risk evidence into practical adaptation investments. To provide the evidence base for these investments, the next chapter synthesises the key findings of the CRVA, highlighting the district's major climate hazards, vulnerable sectors, priority hotspots, and adaptation needs that informed subsequent prioritisation and planning.

2. CLIMATE RISKS AND PRIORITY ADAPTATION NEEDS

2.1 Introduction

This chapter synthesises the key findings of the Kumbungu CRVA (Available here: <https://sigraghana.org/resources/>) and presents the major climate risks, sectoral vulnerabilities, climate risk hotspots, and priority adaptation needs that underpin the development of this Costed Adaptation Plan. It focuses on the most decision-relevant findings, including the sectors, communities, and population groups requiring priority adaptation attention.

The findings were validated through a multi-stakeholder adaptation planning workshop involving district departments, decentralised agencies, community representatives, traditional authorities, and development partners. Particular attention is given to the differentiated impacts of climate hazards on women, youth, migrants, older persons, persons with disabilities, and climate-sensitive livelihood groups. The chapter provides the evidence base for the adaptation prioritisation process in Chapter Three and the costed adaptation actions presented in Chapter Four.

2.2 Key Climate Hazards Affecting Kumbungu District

The Kumbungu CRVA identified drought, flooding, water scarcity, bushfires, and pests and diseases as the principal climate-related hazards affecting livelihoods, ecosystem services, and development across the district (**Table 2**). These hazards interact with the district's high dependence on rain-fed agriculture, limited irrigation infrastructure, environmental degradation, poverty, and existing social inequalities to increase vulnerability and constrain adaptive capacity. Women, smallholder farmers, youth, persons with disabilities, migrant farmers, and low-income households are disproportionately affected because of their limited access to productive resources, climate information, finance, irrigation infrastructure, agricultural inputs, and adaptive technologies.

Table 2: Key climate-related hazards affecting Kumbungu District

Climate Hazard	Description	Observed Impacts
Drought	Recurrent dry spells, delayed onset of rains, and increasing rainfall variability affecting predominantly rain-fed agricultural systems across the district.	Reduced crop yields, crop failure, livestock stress, food insecurity, loss of household income, depletion of water sources, and increased vulnerability of smallholder farmers.
Flooding	Seasonal flooding resulting from intense rainfall events, poor drainage systems, and the district's relatively flat terrain, particularly affecting low-lying communities.	Damage to homes, roads, bridges, and farmlands; displacement of households; loss of crops and livestock; disruption of transportation and market access; increased risk of waterborne diseases.
Water Scarcity	Reduced availability of surface and groundwater resources due to erratic rainfall patterns, prolonged dry seasons, and increasing pressure on water infrastructure.	Limited access to safe drinking water, reduced irrigation potential, increased time spent collecting water (particularly by women and girls), heightened health risks, and declining agricultural productivity.
Bushfires	Frequent dry-season fires driven by high temperatures, prolonged drought conditions, strong winds, and unsustainable land-use practices.	Destruction of crops, grazing lands, stored food, and vegetation resources; loss of biodiversity; reduced availability of fuelwood and non-timber forest products; declining livelihoods for farming households and women engaged in shea and other forest-based activities.

Climate Hazard	Description	Observed Impacts
Pests and Diseases	Increasing outbreaks of crop pests, livestock diseases, and post-harvest infestations associated with changing climatic conditions, including erratic rainfall and rising temperatures.	Reduced crop yields, livestock mortality, increased production costs, post-harvest losses, food insecurity, reduced household incomes, and increased vulnerability of smallholder farmers and women farmers.

Source: Kumbungu CRVA ((Available here: <https://sigraghana.org/resources/>))

The combined effects of these hazards threaten agricultural productivity, food security, water availability, public health, livelihoods, and critical infrastructure, highlighting the need for targeted, gender-responsive, and climate-resilient adaptation investments.

2.3 Priority Vulnerable Sectors

The Kumbungu CRVA identified Agriculture, Infrastructure, Health, Water Resources, and Gender and Social Inclusion as the priority sectors requiring adaptation interventions (**Table 3**). Agriculture is the most climate-sensitive sector due to its dependence on rain-fed production, while infrastructure, health, and water resources are increasingly affected by floods, droughts, extreme heat, erosion, and water scarcity. Climate change also exacerbates existing social and economic inequalities, disproportionately affecting women, youth, persons with disabilities, migrant households, and resource-poor farmers. These sectoral priorities were validated through stakeholder consultations and informed the adaptation prioritisation process underpinning this Costed Adaptation Plan.

Table 3: Priority vulnerable sectors and climate sensitivities identified in the Kumbungu CRVA

Sector	Most Significant Climate Risks	Key Sensitivities Identified in the CRVA
Agriculture	Floods, drought, windstorms, extreme heat	Agriculture is the most climate-sensitive sector in the district. Floods destroy crops and fertile topsoil, drought reduces water availability and crop yields, while windstorms and bushfires damage crops, stored produce, and farm infrastructure. The sector's heavy dependence on rain-fed farming makes smallholder farmers particularly vulnerable. Women farmers face additional constraints due to limited access to land, irrigation technologies, and financial resources.
Infrastructure	Floods, erosion, windstorms	Flooding and erosion frequently damage roads, bridges, drainage systems, and housing, disrupting access to markets, schools, and health facilities. Poorly constructed buildings are also vulnerable to windstorm damage. Infrastructure failures often isolate communities and increase the costs of service delivery.
Health	Floods, extreme heat, drought	Flooding increases exposure to waterborne diseases such as diarrhoea, cholera, and typhoid through contamination of water sources. Drought and water scarcity worsen sanitation conditions, while extreme heat increases risks of dehydration, heat stress, and

Sector	Most Significant Climate Risks	Key Sensitivities Identified in the CRVA
		respiratory illnesses, particularly among women, children, the elderly, and outdoor workers.
Water Resources	Drought, water scarcity, floods	Water resources are highly sensitive to both drought and flooding. Prolonged dry periods reduce water availability for domestic use, livestock, and agriculture, while flooding contaminates water sources and reduces drinking water quality. Women and girls are disproportionately affected due to their primary role in water collection and household water management.
Gender and Social Inclusion	All climate hazards	Climate risks amplify existing social and economic inequalities. Women, youth, persons with disabilities, elderly persons, migrant households, and low-income groups often have limited access to land, finance, climate information, and adaptive technologies, increasing their exposure and reducing their ability to recover from climate shocks.

Source: Kumbungu CRVA (Available here: <https://sigraghana.org/resources/>)

2.4 Climate Risk Hotspots and Affected Communities

Although drought and water scarcity affect most communities across the Kumbungu District, the CRVA and stakeholder validation exercises identified several communities that experience particularly acute and recurring climate impacts due to their geographic location, livelihood dependence, infrastructure deficits, and exposure to multiple hazards (**Table 4**). These communities from the CRVA findings represent priority climate risk hotspots where adaptation investments are likely to generate the greatest resilience benefits.

Table 4: Priority climate risk hotspots in Kumbungu District

Community	Dominant Climate Risks	Key Impacts
Nawuni	Flooding, drought, water scarcity	Housing damage, crop losses, sanitation breakdown, displacement of households, and seasonal water shortages
Apayili	Flooding, drought	Health risks, disruption of mobility and access to services, and reduced agricultural productivity
Zuggu	Flooding, drought, pests and diseases	Crop losses, livelihood disruption, increased agricultural vulnerability, and damage to community infrastructure
Kpalsogun	Water scarcity, drought	Limited access to potable water, reduced agricultural production, increased time spent collecting water, and heightened vulnerability to water-related diseases
Gbullung / Gbullungkuli	Flooding, erosion, drought	Road and drainage damage, water system stress, reduced agricultural productivity, and disruption of market access
Bognaayili	Flooding, drought, water scarcity	Damage to infrastructure and settlements, seasonal water shortages, and livelihood disruption

Source: Kumbungu CRVA (Available here: <https://sigraghana.org/resources/>)

2.5 Priority Affected Groups

The CRVA found that climate vulnerability in Kumbungu District is not uniform. Differences in livelihood dependence, access to productive resources, mobility, and adaptive capacity mean that some population groups face disproportionately higher exposure to climate risks and greater challenges in recovering from climate shocks. **Table 5** summarises the priority affected groups and the key factors contributing to their vulnerability.

Table 5: Priority affected groups and key vulnerability characteristics

Priority Group	Key Climate Vulnerabilities
Women	Dependence on small-scale agriculture and natural resource-based livelihoods, responsibility for household water collection, and limited access to land, finance, irrigation technologies, and climate information.
Smallholder Farmers	High dependence on rain-fed agriculture exposes them to drought, erratic rainfall, floods, bushfires, pests, and diseases, resulting in crop losses and declining incomes.
Youth	Reliance on seasonal agricultural employment and limited livelihood diversification increase vulnerability to climate-related income losses and migration pressures.
Migrants	Limited access to land, agricultural extension services, social networks, and climate support programmes reduces adaptive capacity.
Older Persons	Reduced mobility and limited capacity to cope with extreme heat, water scarcity, disease outbreaks, and post-disaster recovery.
Pregnant Women and Nursing Mothers	Greater health risks during periods of extreme heat, food insecurity, water shortages, and disruptions to healthcare services.
Persons with Disabilities	Barriers to accessing water, healthcare, emergency services, and adaptation interventions, particularly during floods and infrastructure disruptions.

The CRVA further showed that vulnerability is often compounded where climate exposure intersects with poverty, gender inequality, disability, and limited access to productive resources. For example, during the assessment team's visit to Nawuni, community members reported that the combined effects of prolonged drought and subsequent flooding had resulted in repeated crop losses, food shortages, and increased dependence on external support, with women carrying a significant share of household recovery responsibilities. These findings informed the gender-responsive and socially inclusive adaptation actions prioritised in this CAP.

2.6 Implications for District Investment and Planning

The climate risks and vulnerabilities identified through the CRVA and validated during stakeholder consultations underscore the need for strategic adaptation investments in Kumbungu District. Given resource constraints, investments should be prioritised based on their potential to reduce climate risks, strengthen resilience, protect vulnerable groups, and contribute to the district's development objectives.

The findings presented in this chapter provide the evidence base for the adaptation prioritisation process described in Chapter Three, where stakeholders used a Multi-Criteria Analysis (MCA) to identify and rank priority adaptation actions for inclusion in this Costed Adaptation Plan.

The assessment highlights five key investment priorities:

- 1) Strengthen drought resilience, water security, and climate-smart agriculture to reduce dependence on rain-fed livelihoods.
- 2) Improve the resilience of infrastructure and settlements to flooding and other climate hazards.

- 3) Expand access to safe water, sanitation, and climate-sensitive health services.
- 4) Promote diversified livelihoods and targeted support for women, youth, persons with disabilities, migrants, and other vulnerable groups.
- 5) Mainstream climate adaptation into district planning, budgeting, and investment processes.

2.7 Link to Subsequent Chapters

This chapter has presented the key climate hazards, sectoral vulnerabilities, priority affected groups, and investment implications identified through the Kumbungu CRVA and validated during stakeholder consultations. These findings provide the foundation for the adaptation planning and investment decisions presented in the subsequent chapters.

- **Chapter Three** describes the participatory process used to identify, assess, and prioritise adaptation actions. It outlines how stakeholders applied the MCA framework to evaluate proposed interventions against agreed criteria, including relevance, feasibility, impact, sustainability, gender and social inclusion, and institutional alignment.
- **Chapter Four** presents the prioritised adaptation actions as costed investment packages, including implementation arrangements, indicative budgets, financing opportunities, and monitoring considerations to support integration into district planning, budgeting, and resource mobilisation processes.

3. ADAPTATION PRIORITISATION PROCESS AND LEARNING OUTCOMES

3.1 Introduction

This chapter describes the process used to translate the climate risks and vulnerabilities identified in the Kumbungu CRVA into a prioritised set of adaptation actions for inclusion in the CAP. Recognising the district's multiple climate risks, competing development priorities, and resource constraints, a participatory prioritisation process was undertaken to identify adaptation actions that are evidence-based, technically feasible, socially inclusive, and aligned with district development priorities.

The prioritisation process was undertaken during **Workshop 1**, bringing together representatives from the District Assembly, decentralised departments, traditional authorities, community representatives, civil society organisations, and development partners. Building on the CRVA findings, participants reviewed climate risks, sectoral vulnerabilities, affected communities, and vulnerable population groups before identifying, assessing, and ranking adaptation options using a participatory MCA framework (**Plate 1**).

The process ensured that adaptation priorities reflected local needs while aligning with national adaptation priorities and principles of gender-responsive and inclusive climate adaptation. Particular consideration was given to the needs of women, youth, migrants, older persons, persons with disabilities, and other climate-vulnerable groups identified through the CRVA.

This chapter documents the prioritisation methodology, the criteria used to evaluate adaptation options, the results of the MCA process, and the key learning outcomes that emerged from stakeholder engagement. It provides a transparent basis for the investment priorities presented in Chapter Four and supports future climate-responsive planning and resource mobilisation within the district.

Specifically, the chapter:

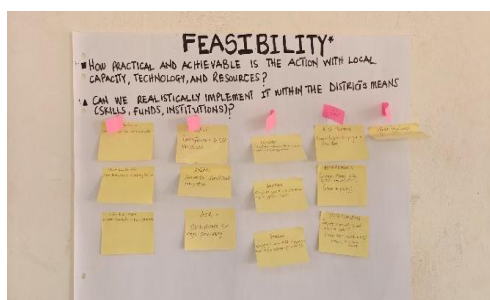
- explains how CRVA findings were translated into prioritised adaptation actions through a participatory, evidence-based process;
- describes the methodology used to identify, assess, and rank adaptation options;
- provides a transparent record of the prioritisation process to support planning, investment, and resource mobilisation;
- demonstrates that the prioritisation process was district-led, gender-responsive, and aligned with local development priorities; and
- highlights the institutional and capacity development outcomes of the stakeholder engagement process.

This chapter describes the process through which Kumbungu District moved from the climate risks and vulnerabilities identified in the CRVA to a prioritised set of adaptation actions for inclusion in the CAP. Recognising that the district faces multiple climate hazards and competing development needs, a structured prioritisation process was undertaken to identify adaptation actions that are technically relevant, socially inclusive, financially realistic, and institutionally feasible.

Plate 1: Scenes from Workshop 1 of the CAP design phase



Plate 2 (a): Workshop 1 participants actively engaging in group exercises (b) photos illustrating output from some of the group exercises



3.2 Overview of the Prioritisation Approach

The prioritisation approach was designed to translate the findings of the Kumbungu Climate CRVA into a practical set of adaptation actions for integration into district planning, budgeting, and investment processes. The process combined scientific evidence, local knowledge, stakeholder experience, and structured decision-making tools to identify adaptation actions that would deliver the greatest resilience benefits while remaining technically feasible, socially inclusive, and aligned with district development priorities.

The process drew upon four principal sources of information (**Table 6**):

- 1) Findings from the Kumbungu CRVA, including climate hazards, sectoral vulnerabilities, risk hotspots, and priority affected groups;
- 2) Technical expertise from district departments, decentralised agencies, and frontline service providers;
- 3) Community experiences and stakeholder perspectives on climate impacts, adaptation needs, and implementation realities; and
- 4) Participatory prioritisation tools, including sector-based screening exercises and MCA.

The process ensured that the selected adaptation actions were:

- responsive to the district's priority climate risks;
- technically feasible and institutionally achievable;
- aligned with departmental mandates and development priorities;
- gender-responsive and socially inclusive;
- capable of delivering measurable resilience benefits; and
- suitable for costing, budgeting, and resource mobilisation.

Table 6: Summary of the prioritisation steps, tools used, and outputs

Step	Objective	Tool / Method	Participants	Key Output
Step 1	Review CRVA findings and identify sector-relevant adaptation options	Sector-based screening and longlisting exercise	District departments, decentralized agencies, planners and stakeholders	Sector-specific shortlist of priority adaptation options
Step 2	Assess the relevance and justification of shortlisted actions	Criteria alignment and stakeholder deliberation	Sector groups (mixed representation including women and vulnerable groups)	Agreed rationale and justification for priority actions
Step 3	Rank adaptation options using transparent criteria	Multi-Criteria Analysis with agreed weights and scoring system	Sector groups	Ranked adaptation actions by sector
Step 4	Prepare priority actions for investment planning	Preliminary costing and implementation planning exercise	Sector groups and technical officers	Indicative cost estimates and implementation considerations for top-ranked actions

The prioritisation process was implemented through a series of participatory exercises during Workshop 1, progressing from the review of climate risks and identification of adaptation options to the ranking and preliminary costing of priority interventions for inclusion in the Costed Adaptation Plan.

3.3 Step 1: Development of the Adaptation Long List and Sector Group Formation

3.3.1 Basis for the Adaptation Long List

The first step in the prioritisation process involved developing a long list of adaptation actions based on the findings of the Kumbungu CRVA, stakeholder consultations, and district development priorities. Proposed interventions were directly linked to the priority climate risks, sectoral vulnerabilities, and adaptation needs identified during the assessment.

For example, drought and water scarcity informed interventions such as climate-smart agriculture, irrigation development, borehole rehabilitation, and rainwater harvesting, while flooding informed proposals for drainage improvements, flood protection measures, climate-resilient infrastructure, sanitation improvements, and community-based early warning systems. Bushfires, pests, and diseases informed interventions including agroforestry, livelihood diversification, climate-smart farming practices, and strengthened agricultural extension services.

The long list comprised:

- existing interventions that could be strengthened, expanded, or replicated; and
- new adaptation actions designed to address priority climate risks, service delivery gaps, and vulnerabilities identified through the CRVA and stakeholder consultations.

This long list provided the basis for the subsequent screening, assessment, and prioritisation of adaptation actions.

3.3.2 Sector Group Formation and Inclusion

Workshop participants were organised into sector groups corresponding to the priority sectors identified through the CRVA and district planning processes. This enabled participants to assess adaptation options from both technical and practical perspectives while drawing on local knowledge and implementation experience.

Each group comprised four to five participants representing:

- District Assembly departments;
- decentralised government agencies;
- technical officers and planners;
- community representatives and other local stakeholders; and
- both male and female participants, with representation of vulnerable groups where possible.

The sector groups covered the following thematic areas:

- Agriculture;
- Infrastructure;
- Health;
- Water Resources; and
- Gender and Social Inclusion.

Gender and Social Inclusion was treated as a cross-cutting theme to ensure that adaptation actions addressed the needs of women, youth, migrants, older persons, persons with disabilities, and other vulnerable groups identified through the CRVA.

The sector group approach encouraged collaboration across institutions while ensuring that adaptation priorities remained aligned with district responsibilities, implementation capacity, and local development needs.

3.4 Step 2: Sector-Based Shortlisting of Priority Adaptation Measures

3.4.1 Exercise Overview

Following the development of the adaptation long list, participants worked within their sector groups to identify the adaptation measures considered most relevant, feasible, and impactful for addressing Kumbungu District's priority climate risks. Drawing on the CRVA, local implementation experience, and sector mandates, each group shortlisted adaptation options for assessment through the MCA.

During the exercise, participants reached consensus on:

- priority adaptation measures;
- the climate risks addressed by each measure;
- target communities and beneficiary groups; and
- the institutions best placed to lead and support implementation.

This exercise narrowed the long list into a manageable set of priority adaptation measures for detailed evaluation and ranking.

3.4.2 Examples of Sector Shortlist Outputs

The sector-based screening produced a preliminary portfolio of adaptation measures across the five priority sectors (**Table 7**). For each measure, participants identified the principal climate risks addressed, target communities, primary beneficiaries, and lead and supporting institutions, ensuring that the shortlisted options reflected district priorities and existing implementation responsibilities.

The shortlisting exercise revealed three key observations. First, interventions addressing drought, flooding, and water scarcity consistently emerged as the highest priorities across sectors, reflecting the district's principal climate risks. Second, participants prioritised actions that would benefit vulnerable groups identified through the CRVA, particularly women, youth, smallholder farmers, migrants, older persons, pregnant women, and persons with disabilities. Third, many adaptation measures offered multiple benefits across sectors. For example, investments in water infrastructure were recognised as supporting agricultural production, improving public health, reducing the burden of water collection, and strengthening resilience to drought. These findings underscore the importance of integrated and cross-sectoral adaptation planning in Kumbungu District.

Table 7: Preliminary shortlisted adaptation options by sector following the sector-based screening

Sector	Option	Adaptation Measure	Climate Risk Addressed	Target Communities	Primary Beneficiaries	Lead / Supporting Institutions
Agriculture	1	Climate-Smart Agriculture (CSA) training	Drought, erratic rainfall, declining yields	District-wide	Farmers, women, youth	Department of Agriculture / NGOs
	2	Small-scale irrigation development and O&M training	Drought, water scarcity, food insecurity	Drought-prone farming communities	Farmers, women farmers	Department of Agriculture, GIDA, Works Department
	3	Microfinance support for agro-processing enterprises	Climate-induced livelihood vulnerability	District-wide	Women processors, youth	Department of Agriculture, BAC, Rural Banks
	4	Organic composting and agroforestry promotion	Soil degradation, bushfires, declining soil fertility	District-wide	Farmers, youth	Department of Agriculture, CSIR-SARI, NGOs
Infrastructure	1	Flood-resilient housing and elevated structures	Flooding	Nawuni, Apayili, Zuggu	Women, farmers, vulnerable households	District Assembly (Works Department)
	2	Climate-resilient road improvements	Flooding, erosion, mobility disruption	Gbullung, Nawuni and surrounding communities	Farmers, traders, transport operators	Works Department, Feeder Roads Department
	3	Drainage rehabilitation and flood control measures	Flooding	Flood-prone settlements	Entire community	Works Department, NADMO
	4	Flood embankments and erosion protection works	Flooding, erosion	High-risk flood zones	Flood-prone communities	District Assembly, Hydrological Services, EPA
Health	1	Strengthen healthcare response to waterborne diseases	Flooding, water contamination	Kpalsogun, Nawuni, Apayili	Women, children, PWDs, farmers	GHS / NADMO, District Assembly
	2	Community waste and water management programmes	Flooding, poor sanitation, disease outbreaks	Kumbungu and surrounding communities	Entire community	Environmental Health Unit / District Assembly, NGOs

Sector	Option	Adaptation Measure	Climate Risk Addressed	Target Communities	Primary Beneficiaries	Lead / Supporting Institutions
	3	Community-based malaria and vector control programmes	Flooding, stagnant water, disease outbreaks	Flood-prone communities	Women, children, elderly	GHS / Environmental Health Unit
	4	Public awareness and heat-health education campaigns	Extreme heat and health risks	District-wide	Elderly persons, women, outdoor workers, youth	GHS / Information Services Department
Water Resources	1	Borehole construction and rehabilitation	Water scarcity, drought	Gbullungkuli, Namdu and water-stressed communities	Women, children, farmers	District Assembly, CWSA, NGOs
	2	Rainwater harvesting systems and water storage facilities	Water scarcity, drought	District-wide	Women, schools, households	WATSAN Committees, NGOs
	3	Rehabilitation of wells and standpipes	Limited access to potable water	Multiple communities	Women, children, PWDs	District Assembly, CWSA
	4	Water catchment development and protection	Water scarcity, environmental degradation	Water-stressed communities	Farmers, households	WRC, District Assembly
Gender and Social Inclusion	1	Co-develop gender-responsive climate adaptation policies and plans	Cross-cutting climate vulnerabilities	District-wide	Women, youth, PWDs, migrants	Gender Desk, SIGRA, MoGCSP
	2	Mobile childcare and social support services during flood events	Flooding and displacement	Nawuni, Apayili, Zuggu	Women, children	GHS, NADMO, NGOs
	3	Low-interest loans for women-led cooperatives and enterprises	Climate-related livelihood vulnerability	District-wide	Women and women-led groups	BAC, Rural Banks, VSLA Networks
	4	Skills development and alternative livelihood support for women and youth	Drought, bushfires, declining agricultural incomes	District-wide	Women, youth, migrants	Gender Desk, BAC, NGOs

3.5 Step 3: Introduction of MCA Criteria and Justification Logic

3.5.1 MCA Criteria Used

Following the sector-based shortlisting exercise, participants evaluated the shortlisted adaptation options using six agreed criteria to ensure a consistent and transparent assessment across sectors. The criteria reflected the district's adaptation priorities and the objectives of the SIGRA programme.

The six criteria were:

1. **Relevance** – the extent to which an intervention addresses priority climate risks, vulnerabilities, and adaptation needs identified in the CRVA;
2. **Feasibility** – practicality of implementation considering available resources, technical capacity, institutional arrangements, and local conditions;
3. **Impact** – potential to reduce climate risks, strengthen resilience, and generate measurable benefits for communities;
4. **Sustainability** – likelihood that the benefits of an intervention will be maintained beyond the initial investment period;
5. **Gender and Social Inclusion** – extent to which an intervention benefits women, youth, persons with disabilities, migrants, older persons, and other vulnerable groups while reducing existing inequalities; and
6. **Institutional Fit** – alignment with district mandates, sector responsibilities, planning frameworks, and implementation arrangements.

These criteria ensured that adaptation options were assessed not only for their technical effectiveness but also for their practicality, inclusiveness, and long-term viability.

3.5.2 Prioritisation Logic

Each sector group selected its three highest-priority adaptation options from the shortlist and assessed them against the six MCA criteria. Before assigning scores, participants discussed and justified their assessments using evidence from the CRVA together with their technical knowledge and implementation experience.

This deliberative process encouraged participants to consider trade-offs between competing interventions, build consensus, and ensure that gender and social inclusion remained integral to decision-making. It also strengthened confidence that the final rankings reflected both local priorities and practical implementation considerations.

Across the sector groups, interventions addressing drought resilience, flood management, water security, agricultural productivity, and essential service delivery consistently received the strongest support, reflecting their importance for strengthening long-term climate resilience in Kumbungu District.

3.6 Step 4: MCA Weighted Scoring and Ranking

3.6.1 Weighting Approach

Following the shortlisting and assessment of adaptation options, sector groups applied a weighted MCA to rank interventions within each sector (Table 8). The weighting framework reflected the district's adaptation priorities by assigning greater importance to criteria that addressed priority climate risks while ensuring that proposed interventions were feasible, sustainable, and socially inclusive.

The weighted assessment produced:

- weighted scores for each adaptation option;
- ranked priority interventions within each sector;
- documented justification for the rankings; and
- key implementation considerations identified during the group discussions.

The weighting framework emphasised interventions that addressed the district's priority climate risks while supporting practical implementation and inclusive development outcomes.

Table 8: MCA criteria and weights applied during adaptation prioritisation

s/n	Criterion	Weight (%)	Interpretation in the Kumbungu Context
1	Relevance	25	Extent to which the intervention addresses priority climate hazards, vulnerabilities, and adaptation needs identified in the CRVA
2	Impact	25	Potential to significantly reduce climate risks and strengthen resilience outcomes
3	Feasibility	20	Practicality of implementation considering available resources, institutional capacity, and local conditions
4	Sustainability	15	Likelihood that benefits will be sustained beyond the initial investment period
5	Gender and Social Inclusion	10	Extent to which the intervention benefits women, youth, PWDs, migrants, older persons, and other vulnerable groups
6	Institutional Fit	5	Alignment with district mandates, sector responsibilities, and implementation arrangements

3.6.2 Scoring Procedure

Each sector group evaluated its three shortlisted adaptation options against the six MCA criteria using a standardised scoring template (**Table 9**). Scores were assigned for each criterion, multiplied by the corresponding weight, and aggregated to produce an overall weighted score for each intervention.

The scoring process involved:

1. Scoring each adaptation option against the six criteria;
2. Applying the agreed criterion weights;
3. Calculating the total weighted score for each option;
4. Ranking the options from highest to lowest priority within each sector; and
5. Documenting the justification, assumptions, and implementation considerations underpinning the final rankings.

The resulting rankings formed the basis for selecting the priority adaptation actions that were subsequently developed into the costed investment packages presented in Chapter Four.

Table 9: Top-ranked adaptation actions emerging from the Kumbungu CRVA and Workshop 1 MCA prioritisation process

Sector	Rank	Adaptation Action	Target Beneficiaries	Lead Institution	Key Justification
Agriculture	1	Climate-Smart Agriculture (CSA) training and extension support	Smallholder farmers, women farmers, youth farmers	Department of Agriculture	Addresses drought, declining yields, pests, and diseases identified in the CRVA
	2	Irrigation development and management support	Farmers, women and youth engaged in dry-season farming	Department of Agriculture, GIDA	Reduces dependence on erratic rainfall and drought
	3	Support for agro-processing and climate-resilient livelihoods	Women processors, youth groups, farmer cooperatives	Agriculture Department, BAC	Diversifies livelihoods and strengthens household resilience
Infrastructure	1	Flood-resilient road and drainage infrastructure	Farmers, traders, transport users, flood-prone communities	Works Department	Reduces flood disruption and improves market access
	2	Climate-resilient housing and community infrastructure	Women, elderly persons, PWDs, vulnerable households	District Assembly	Reduces exposure to flooding and windstorm impacts
	3	Community-based flood early warning systems	Communities in flood-prone areas	NADMO, GMet	Improves preparedness and reduces disaster losses
Health	1	Strengthen healthcare services for climate-sensitive diseases	Women, children, PWDs, farmers, flood-affected households	Health Directorate, EHSU	Addresses increased disease burden associated with floods and poor sanitation
	2	Community sanitation and hygiene promotion programmes	Entire communities, especially women and children	EHSU	Reduces waterborne disease risks identified in flood-prone communities
	3	Expanded disease surveillance and outreach services	Remote and underserved communities	Health Directorate	Strengthens early detection and response to climate-sensitive diseases

Sector	Rank	Adaptation Action	Target Beneficiaries	Lead Institution	Key Justification
Water Resources	1	Borehole construction and rehabilitation	Women, children, farmers, water-stressed communities	District Assembly, CWSA	Addresses chronic water scarcity identified in the CRVA
	2	Rainwater harvesting and water storage systems	Households, schools, health facilities	District Assembly, NGOs	Improves dry-season water availability
	3	Protection and rehabilitation of water sources	Women, children, migrant households	WATSAN Committees, District Assembly	Improves water quality and long-term water security
Gender and Social Inclusion	1	Support for women-led cooperatives and livelihood groups	Women and female-headed households	Gender Desk Unit	Strengthens economic resilience and adaptive capacity
	2	Skills development and green enterprise support	Youth, migrant youth, vulnerable groups	Gender Desk Unit, BAC	Creates alternative climate-resilient livelihoods
	3	Targeted support for vulnerable groups in adaptation planning	PWDs, elderly persons, migrants, pregnant women	Gender Desk Unit, Social Welfare	Promotes equitable access to adaptation benefits

3.6.3 Sector Ranking Outputs

The MCA produced a ranked set of priority adaptation actions across the Agriculture, Infrastructure, Health, Water Resources, and Gender and Social Inclusion sectors. Overall, interventions that strengthened climate resilience, protected critical services, and supported vulnerable populations consistently achieved the highest scores.

In the Agriculture sector, climate-smart agriculture, irrigation development, farmer training, and livelihood diversification emerged as the highest priorities. Within Water Resources, investments in borehole development and rehabilitation, rainwater harvesting, and improved water infrastructure ranked highest. The Infrastructure sector prioritised flood-resilient roads, drainage improvements, and flood protection measures, while the Health sector emphasised interventions to strengthen prevention and response to climate-sensitive diseases. In the Gender and Social Inclusion sector, priority was given to measures that expand livelihood opportunities and strengthen the resilience of vulnerable groups.

The ranking exercise also demonstrated that many high-priority interventions generate benefits across multiple sectors. For example, investments in water infrastructure support agricultural production, improve public health, enhance household water security, and reduce the burden of water collection. Similarly, climate-smart agriculture contributes to food security, livelihood resilience, and sustainable natural resource management. These synergies reinforce the value of integrated adaptation planning and coordinated implementation.

A small number of interventions with high adaptation potential received comparatively lower scores for feasibility, highlighting the need for additional financing, institutional strengthening, technical support, and strategic partnerships to enable their implementation.

3.7 Participatory Decision-Making and Gender Integration

3.7.1 Participation Quality and Representation

The adaptation prioritisation process was designed to ensure that investment decisions reflected both technical evidence and stakeholder perspectives. Through Workshop 1, representatives from district departments, decentralised agencies, traditional authorities, community representatives, development partners, and technical institutions jointly reviewed adaptation options and applied the MCA to identify sector priorities.

The use of sector group discussions, plenary sessions, and consensus-based scoring promoted transparency, encouraged knowledge sharing across institutions, and enabled participants to collectively evaluate trade-offs among competing adaptation options. This participatory approach strengthened local ownership of the prioritisation process and enhanced the credibility of the final investment priorities.

3.7.2 How Gender and Inclusion Were Integrated

Gender and Social Inclusion was integrated throughout the prioritisation process to ensure that adaptation actions responded to the needs of vulnerable groups identified in the CRVA. Beyond serving as one of the MCA criteria, participants considered who would benefit from each intervention, the barriers different groups face in accessing adaptation support, and how proposed actions could reduce existing inequalities.

These considerations influenced the selection and ranking of adaptation actions across all sectors. Emphasis was placed on interventions that improve resilience among women, youth, migrants, older persons, persons with disabilities, and resource-constrained households, recognising that these groups often face greater exposure to climate risks and more limited adaptive capacity.

3.8 Key Learning Outcomes and Capacity Gains

Beyond identifying priority adaptation investments, the prioritisation process strengthened the capacity of district stakeholders to undertake climate-informed, evidence-based, and inclusive adaptation planning. Through the participatory exercises, participants gained practical experience in linking climate risks to adaptation responses, applying structured prioritisation tools, considering implementation trade-offs, integrating gender and social inclusion into decision-making, and promoting collaboration across sectors.

The process also improved the district's readiness to translate adaptation priorities into implementable projects by identifying priority interventions, implementation responsibilities, potential partnerships, and financing needs. These outcomes provide a stronger foundation for integrating climate adaptation into district planning, budgeting, and resource mobilisation processes (**Table 10**).

Table 10: Key capacity strengthening outcomes from the adaptation prioritisation process

Capacity Area	What Participants Learned	Evidence from the Workshop Process	Why this Matters for CAP Implementation
Risk-Informed Adaptation Planning	Improved ability to link climate hazards and vulnerabilities identified in the CRVA to specific adaptation responses.	Sector groups consistently referenced CRVA findings on drought, flooding, water scarcity, pests and diseases, and bushfires when discussing and ranking adaptation options.	Ensures adaptation investments respond directly to documented climate risks and local priorities.
Application of MCA and Prioritisation Tools	Enhanced understanding of structured adaptation prioritisation methods, including option screening, criteria-based assessment, and MCA scoring.	Participants independently assessed and ranked adaptation options using agreed criteria and weighting systems.	Strengthens district capacity to undertake future adaptation planning, budgeting, and investment prioritisation exercises.
Consideration of Feasibility and Trade-offs	Increased appreciation of the need to balance relevance, impact, feasibility, sustainability, and institutional capacity when selecting interventions.	Discussions frequently examined implementation constraints, resource requirements, and long-term sustainability before final rankings were agreed.	Supports the development of realistic and implementable adaptation plans.
Gender and Social Inclusion Mainstreaming	Improved understanding of how climate risks affect different social groups and how adaptation actions can address inequalities.	Sector groups identified specific beneficiary groups, including women, youth, persons with disabilities, migrants, older persons, and smallholder farmers, when assessing adaptation options.	Helps ensure that adaptation investments are inclusive, equitable, and aligned with SIGRA's gender-responsive objectives.
Cross-Sector Coordination and Investment Planning	Greater recognition of interdependencies across sectors and the institutional arrangements needed for implementation.	Participants identified lead institutions, supporting agencies, target communities, and implementation responsibilities for priority actions.	Strengthens coordination, accountability, resource mobilisation, and integration of adaptation priorities into district planning and budgeting processes.

Source: Adapted from outputs of the Kumbungu Adaptation Prioritisation Workshop (SIGRA, 2025).

3.9 Transition from Prioritisation to Costing and Implementation Planning

Following the completion of the adaptation prioritisation process, a second stakeholder workshop was convened on **9 March 2026** to translate the ranked adaptation priorities into a costed and implementable Climate Adaptation Plan. Representatives from district departments, decentralised agencies, and other key stakeholders reviewed the prioritised actions and developed implementation and costing frameworks to support their integration into district planning and budgeting processes (**Plates 3 and 4**).

Building on the MCA results, sector groups refined the prioritised actions into investment packages by defining the implementation activities, target beneficiaries, institutional responsibilities, resource requirements, and indicative costs for each intervention. The costing exercise also considered capital investments, operational requirements, capacity development, and monitoring needs to ensure that the proposed actions were practical and implementable.

The outputs of this workshop form the basis of **Chapter Four**, which presents the district's prioritised adaptation investments together with their implementation arrangements, indicative budgets, and potential financing sources.

Plate 3: Photocall of Workshop 2 participants



Plate 4: Workshop 2 participants involved in costing exercise



4. COSTED PRIORITY ADAPTATION ACTIONS

4.1 Introduction

This chapter presents the **15 priority adaptation actions** identified for Kumbungu District and their associated investment requirements. Building on the prioritisation process described in Chapter Three, the chapter translates the district's adaptation priorities into costed, implementation-ready investment packages to support planning, budgeting, resource mobilisation, and implementation.

Each adaptation action is presented as a practical investment package, detailing:

- the climate risks addressed;
- target communities and beneficiaries;
- implementation arrangements;
- lead and collaborating institutions;
- implementation modality; and
- estimated investment requirements, including capital, operational, capacity development, monitoring, and implementation support costs.

The investment estimates were developed through participatory activity-based costing undertaken during **Workshop 2 (9 March 2026)** using the SIGRA Adaptation Costing Framework. The estimates represent indicative three-year investment requirements and provide a basis for district planning, budget preparation, project development, and resource mobilisation. Detailed engineering designs and Bills of Materials will be required during project implementation where applicable.

The investment portfolio comprises 15 priority adaptation actions across five sectors—Agriculture, Infrastructure, Health, Water Resources, and Gender and Social Inclusion—with an estimated total investment requirement of **GHS 34,005,000** over the three-year planning period (**Table 11**). Infrastructure accounts for the largest share of the investment portfolio because of the capital-intensive nature of flood protection, drainage improvement, and climate-resilient transport infrastructure, while the remaining sectors focus on strengthening adaptive capacity, improving essential services, protecting livelihoods, and enhancing resilience among vulnerable populations.

Following the sector overview, the chapter presents each priority adaptation action together with its implementation framework, indicative budget, expected outcomes, and potential financing sources to support implementation by the District Assembly and its development partners.

Table 11: Summary of priority adaptation actions and investment requirements by sector

Sector	Number of Priority Actions	Estimated Cost (GHS)	Share of Total Budget (%)
Agriculture	3	5,259,000	15.5
Infrastructure	3	22,000,000	64.7
Health	3	2,056,000*	6.0
Water Resources	3	2,453,000*	7.2
Gender and Social Inclusion	3	2,237,000	6.6
Total	15	34,005,000	100.0

*Subject to validation during detailed design and budgeting.

4.2 Costing Assumptions

The indicative costs presented in this chapter were developed using the Adaptation Costing Framework, which applies a standardised activity-based approach to estimating investment requirements for climate adaptation interventions. The estimates were prepared collaboratively with district technical staff using recent implementation experience, sector planning information, and prevailing local market rates (**Table 12**).

The estimates are intended to support investment planning and should not be interpreted as detailed engineering or procurement costs. Individual projects will require further refinement through detailed design, Bills of Quantities (BoQs), and procurement processes before implementation.

The costing approach was based on four key principles:

1. Bottom-up estimation using district knowledge and sector expertise.
2. Activity-based costing covering capital, operational, maintenance, capacity development, monitoring, and implementation support costs.
3. Consistent costing assumptions across all sectors.
4. Consideration of realistic financing opportunities available to government and development partners.

Table 12 summarises the key assumptions applied across all sectors during the costing process.

Table 12: Key Costing assumptions applied across sectors

Item	Assumption
Costing Framework	SIGRA Adaptation Costing Framework and Workshop 2 costing templates
Cost Type	Capital investments, operations and maintenance, capacity development, monitoring and evaluation, and implementation support costs
Costing Approach	Activity-based, bottom-up estimation using district-level knowledge and recent project experience
Time Horizon	Three years (short- to medium-term implementation period)
Currency	Ghana Cedis (GHS)
Inflation	Not applied; estimates represent indicative planning costs at the time of assessment
Unit Costs	Based on recent district projects, sector agency experience, and prevailing local market rates
Financing Assumption	Multiple financing sources may be required, particularly for large infrastructure investments
Level of Accuracy	Suitable for planning, budgeting, and resource mobilisation; subject to refinement during detailed design and procurement

4.3 Overview of Sectoral Costed Adaptation Actions

4.3.1 Agriculture

Agriculture is the primary livelihood and economic sector in Kumbungu District and was identified in the CRVA as one of the sectors most vulnerable to climate change. The sector is increasingly affected by prolonged droughts, erratic rainfall, flooding, pests and diseases, bushfires, and land degradation, all of which reduce agricultural productivity, threaten food security, and undermine household livelihoods. The district's heavy reliance on rain-fed agriculture, coupled with limited irrigation infrastructure, constrained access to agricultural inputs, extension services, finance, and climate information, further increases the vulnerability of smallholder farmers, particularly women and youth.

The MCA identified three priority investments to address the major climate risks facing agriculture in Kumbungu District. As shown in **Table 13**, the investment portfolio promotes climate-smart agriculture, expands access to irrigation and water management, and strengthens agricultural value chains to reduce post-harvest losses and improve market access. Together, these investments will increase agricultural productivity, strengthen food security, and improve the resilience of farming households to climate variability and change.

Table 13: Prioritised and costed adaptation actions-agriculture

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
1	100	Climate-Smart Agriculture Training and Extension	Establish 10 climate-smart agriculture demonstration farms and train approximately 1,000 farmers in climate-smart agriculture, agroforestry, soil and water conservation, integrated pest and disease management, and the use of climate information services. Strengthen agricultural extension services to promote widespread adoption of resilient farming practices.	Smallholder farmers, women farmers, youth farmers	Increase farmers' adaptive capacity and promote widespread adoption of climate-smart agricultural practices to improve productivity and resilience.	- Number of demonstration farms established - Number of farmers trained - Percentage of farmers adopting climate-smart agriculture practices - Percentage increase in crop productivity among participating farmer	Short–Medium Term	Human, Technical and Financial Resources	Department of Agriculture	MoFA, CSIR, Farmer-Based Organisations (FBOs), NGOs, Development Partners	2,621,000	DACF, MoFA Programmes, Green Climate Fund (GCF), Adaptation Fund, Development Partners, Private Sector
2	98	Small-Scale Irrigation Development and Water Management	Conduct hydrogeological assessments; rehabilitate and construct five community irrigation schemes; install solar-powered pumping systems and water storage	Smallholder farmers, women groups, youth farmers	Improve access to reliable water for agriculture and reduce dependence on increasingly erratic rainfall.	- Number of irrigation schemes developed or rehabilitated - Hectares brought under irrigation - Number of farmers with improved	Medium–Long Term	Human, Technical and Financial Resources	Department of Agriculture / GIDA	GIDA, Water Resources Commission, NGOs, Community Water Management Committees, Development Partners	2,170,000	DACF, GIDA, GCF, Adaptation Fund, Development Partners, Public–Private Partnerships

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
			facilities; establish 20 keyhole gardens; and strengthen community-based water management systems to support year-round agricultural production.			access to irrigation • Percentage reduction in drought-related crop losses						
3	97	Agro-processing and Agricultural Value Chain Support	Strengthen agricultural value chains by establishing and supporting 20 Village Savings and Loan Associations, providing business development services, facilitating access to finance and markets, and promoting women-led agro-processing enterprises to reduce post-harvest losses and improve household livelihoods.	Women processors, farmer groups, youth enterprises	Enhance value addition, strengthen climate-resilient livelihoods, and improve market access and income opportunities for vulnerable farming households.	• Number of VSLAs established or strengthened • Number of women- and youth-led enterprises supported • Percentage increase in household income • Reduction in post-harvest losses	Short–Medium Term	Human, Technical and Financial Resources	Department of Agriculture / Business Advisory Centre (BAC)	BAC, Rural Banks, Microfinance Institutions, MoFA, Women's Groups, NGOs, Private Sector	468,000	DACF, Business Development Support Programmes, Development Partners, Microfinance Institutions, Private Sector, CSR Initiatives
Agriculture Sector Total Investment											5,259,000	

4.3.2 Infrastructure

The Infrastructure sector was identified in the CRVA as one of the sectors most vulnerable to climate change in Kumbungu District. Recurrent flooding, erosion, and windstorms continue to damage roads, culverts, bridges, drainage systems, and other public infrastructure, disrupting access to markets, schools, health facilities, and essential services. These impacts disproportionately affect farming communities, women, traders, older persons, and persons with disabilities by increasing travel times, limiting market access, and reducing access to critical social services.

The MCA identified three priority investments to address the District's most significant infrastructure-related climate risks. As presented in **Table 14**, the investment portfolio includes flood protection infrastructure, climate-proof roads and market access infrastructure, and drainage rehabilitation and improvement. These investments will reduce flood damage, improve year-round access to communities and markets, protect critical infrastructure, and strengthen the resilience of the District's transport and drainage systems.

Table 14: Prioritised and costed adaptation actions – Infrastructure Sector

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
1	70	Flood Embankments and Flood Protection Infrastructure	Construct and rehabilitate flood embankments and associated flood protection structures in priority flood-prone communities, including Nawuni, Apayili, Zuggu and other locations identified through detailed engineering assessments, to protect settlements, agricultural land and critical public infrastructure from recurrent flooding.	Flood-prone households, farmers, women, children, schools and health facilities	Reduce the impacts of recurrent flooding on communities, critical infrastructure and agricultural livelihoods through the construction and rehabilitation of flood protection infrastructure.	- Kilometres of embankments constructed or rehabilitated - Number of communities protected from flooding - Reduction in flood-related infrastructure damage - Number of households benefiting	Medium–Long Term	Human, Financial, Technical and Infrastructure Resources	District Assembly (Works Department)	Hydrological Services Department, NADMO, Department of Feeder Roads, Traditional Authorities, Community Leaders and Development Partners	14,200,000	DACF, Road Fund, GCF, Adaptation Fund, Development Partners, Government of Ghana

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
2	60	Drainage Rehabilitation and Improvement	Rehabilitate, expand and routinely maintain drainage systems in priority flood-prone settlements through desilting, construction of priority drainage channels, rehabilitation of damaged drains, and improved stormwater management infrastructure.	Urban and peri-urban households, businesses, schools, health facilities	Improve stormwater management and reduce flood risks affecting vulnerable communities, public infrastructure and essential services.	- Kilometres of drains rehabilitated or constructed - Number of settlements with improved drainage - Reduction in flood incidence - Percentage of drainage infrastructure functioning effectively during heavy rainfall events	Short–Medium Term	Human, Financial, Technical and Infrastructure Resources	District Assembly (Works Department)	Hydrological Services Department, Environmental Protection Authority (EPA), NADMO, Community-Based Organisations, Development Partners	5,400,000	DACF, District Assembly, GCF, Development Partners, Government Infrastructure Programmes
3	42	Climate-Proof Roads and Market Access Infrastructure	Rehabilitate and climate-proof five priority feeder roads, construct or rehabilitate 10 culverts, strengthen drainage crossings, and implement road resilience measures to maintain year-round access between farming communities, markets and essential services.	Farmers, traders, transport operators, women traders, youth	Improve climate-resilient transport connectivity while reducing climate-related disruptions to trade, mobility and access to essential services.	- Kilometres of feeder roads climate-proofed - Number of culverts constructed or rehabilitated - Reduction in transport disruptions during the rainy season - Improvement in year-round market accessibility	Medium–Long Term	Human, Financial, Technical and Infrastructure Resources	Works Department/ Department of Feeder Roads	Ghana Highway Authority, District Assembly, Contractors, Development Partners	2,400,000	DACF, Road Fund, Ministry of Roads and Highways, Development Partners, Public–Private Partnerships
Infrastructure Sector Total Investment											22,000,000	

4.3.3 Health

The Health sector was identified in the CRVA as highly vulnerable to flooding, drought, water scarcity, and extreme heat due to their effects on disease transmission, water quality, sanitation, nutrition, and access to healthcare services. Flooding increases the incidence of waterborne diseases through contamination of water sources, while drought and water scarcity reduce access to safe water and compromise hygiene practices. Extreme heat further increases health risks among children, pregnant women, older persons, persons with disabilities, outdoor workers, and individuals with pre-existing health conditions.

Based on the MCA results, three priority investments were selected for the health sector. As presented in **Table 15**, the investment portfolio includes hygiene and environmental health promotion, community-based malaria and disease control, climate-sensitive disease surveillance and community health outreach. These investments will reduce the incidence of climate-sensitive diseases, strengthen preventive healthcare, improve disease surveillance and early response, and enhance the resilience of vulnerable populations across Kumbungu District.

Table 15: Prioritised adaptation investment portfolio – Health Sector

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
1	84	Hygiene and Environmental Health Promotion Campaigns	Conduct quarterly hygiene and environmental health promotion campaigns across 12 climate-vulnerable communities, focusing on safe water handling, household sanitation, solid waste management, flood preparedness, and prevention of climate-sensitive diseases through community outreach, schools and local media.	Women, children, households in flood-prone communities, school children	Improve hygiene and sanitation practices and reduce the incidence of climate-sensitive waterborne and sanitation-related diseases	- Number of communities reached - Number of hygiene campaigns conducted - Percentage increase in households adopting improved hygiene practices - Reduction in reported waterborne disease cases	Short–Medium Term	Human, Financial and Technical Resources	Environmental Health Unit / District Health Directorate	Ghana Health Service, Community Health Volunteers, NADMO, NGOs, Traditional Authorities	266,000	DACF, District Health Budget, UNICEF, WHO, Development Partners
2	77	Community-Based Malaria and Disease Control Programme	Implement malaria prevention campaigns in 15 high-risk communities by	Children under five, pregnant women,	Reduce the incidence of malaria and other climate-sensitive	Number of mosquito nets distributed	Short–Medium Term	Human, Financial and Technical Resources	District Health Directorate	Ghana Health Service, Environmental Health Unit, Community	360,000	National Malaria Control Programme, DACF, Global

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
			distributing approximately 1,000 insecticide-treated mosquito nets, strengthening environmental vector control, undertaking community awareness campaigns, and supporting community-based disease surveillance and rapid response activities.	vulnerable households	vector-borne diseases in vulnerable communities.	- Number of communities implementing vector control activities - Reduction in reported malaria cases - Number of households reached through awareness campaigns				Health Volunteers, NGOs		Fund, Development Partners
3	75	Climate-Sensitive Disease Surveillance and Community Health Outreach	Strengthen disease surveillance and early warning systems through regular community outreach in 12 climate-vulnerable communities; improve early detection and reporting of climate-sensitive diseases; strengthen risk communication; and support Community-based Health Planning and Services (CHPS) outreach to remote settlements	Women, children, older persons, persons with disabilities, remote communities	Strengthen early detection, reporting, and response to climate-sensitive diseases while improving access to community health services.	- Number of communities covered by surveillance systems - Number of outreach activities conducted annually - Percentage of priority health facilities submitting timely disease surveillance reports - Reduction in response time to disease outbreaks	Medium Term	Human, Financial and Technical Resources	District Health Directorate / Ghana Health Service	CHPS Compounds, NADMO, EPA, Community Health Volunteers, Development Partners	1,430,000	DACF, Ghana Health Service, WHO, UNICEF, Adaptation Fund, Development Partners
Health Sector Total Investment											2,056,000	

4.3.4 Water Resource

The Water Resources sector was identified in the CRVA as highly vulnerable to drought, water scarcity, flooding, and water contamination. Erratic rainfall patterns, prolonged dry periods, and increasing pressure on existing water infrastructure continue to reduce access to safe and reliable water for domestic use, agriculture, and livestock production. Women and girls are particularly affected because they bear primary responsibility for water collection, often travelling long distances during the dry season. Flood events also increase the contamination of water sources, contributing to the spread of waterborne diseases and placing additional pressure on community water systems.

The prioritisation process selected three investments to strengthen water security and climate resilience in Kumbungu District. As presented in **Table 16**, the investment portfolio includes construction and rehabilitation of boreholes, rainwater harvesting systems, and community water resource protection and management. These investments will increase access to safe and reliable water, strengthen water security during periods of drought and rainfall variability, and improve the long-term sustainability of the District's water resources.

Table 16: Prioritised adaptation investment portfolio – Water Resources Sector

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
1	88	Construction and Rehabilitation of Boreholes	Conduct hydrogeological investigations to identify suitable groundwater sources; construct five (5) new boreholes; rehabilitate five (5) existing boreholes in underserved communities; install hand pumps and associated water access facilities; and establish 10 community water management committees to support the operation and maintenance of water facilities.	Women, girls, households, schools, health facilities, livestock keepers	Improve equitable access to safe and reliable water while strengthening the sustainability of community water infrastructure.	- Number of new boreholes constructed - Number of boreholes rehabilitated - Number of households with improved access to safe water - Number of functional community water management committees	Medium Term	Human, Financial, Technical and Infrastructure Resource	District Assembly / Community Water and Sanitation Agency (CWSA)	CWSA, Water Resources Commission, Traditional Authorities, Community Water Committees, Development Partners	463,000	DACF, CWSA, GCF, Development Partners, Government of Ghana
2	82	Rainwater Harvesting Systems	Install 20 climate-resilient rainwater harvesting systems across selected	Households, schools, health facilities,	Diversify water sources and improve year-	Number of rainwater harvesting	Short–Medium Term	Human, Financial, Technical and	District Assembly / Water and	CWSA, NGOs, Schools, Health	620,000	DACF, Development Partners, GCF, NGOs,

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
			households, schools, health facilities and community institutions. Each system will comprise roof catchments, gutters, first-flush devices, storage tank(s) and associated fittings. Training on system operation, routine maintenance and water quality management will be provided to all beneficiary institutions and households.	women groups	round access to water during periods of drought and water scarcity.	- systems installed - Volume of water harvested annually - Number of beneficiary households and institutions - Percentage of systems functioning after one year		Infrastructure Resource	Sanitation Unit	Facilities, Community Organisations		Corporate Social Responsibility (CSR)
3	78	Community Water Resource Protection and Management	Establish and strengthen 12 Water and Sanitation (WATSAN) Committees, protect water catchments and groundwater recharge areas, undertake routine water quality monitoring, and implement community awareness programmes on watershed conservation, pollution prevention and sustainable water resource management.	Entire communities, water user groups, farmers, women and youth groups	Strengthen community ownership and improve the long-term sustainability and quality of water resources.	- Number of WATSAN Committees established or strengthened - Number of water sources protected - Frequency of water quality monitoring - Percentage increase in community participation in water resource management activities	Medium Term	Human, Financial and Technical Resources	District Assembly / Water Resources Commission	CWSA, EPA, Traditional Authorities, NGOs, Community Water Committees	1,370,000	DACF, Water Resources Commission, Development Partners, GCF, Adaptation Fund
Water Resources Sector Total Investment											2,453,000	

4.3.5 Gender and Social Inclusion

The CRVA demonstrated that climate risks in Kumbungu District are not experienced uniformly across the population. Women, youth, persons with disabilities, migrants, older persons, and female-headed households face disproportionate climate impacts due to limited access to productive resources, finance, climate information, technology, and decision-making opportunities. Women, in particular, are highly exposed through their roles in smallholder agriculture, shea processing, household water collection, caregiving, and informal trading.

To address these inequalities, three high-priority gender-responsive adaptation investments were identified through the MCA. As presented in **Table 17**, the prioritised investment portfolio focuses on strengthening women-led climate-resilient enterprises, expanding green skills and livelihood opportunities for youth and vulnerable groups, and promoting alternative livelihood options that reduce dependence on climate-sensitive and environmentally degrading activities. These investments seek to enhance economic empowerment, strengthen adaptive capacity, and ensure that climate adaptation delivers equitable and inclusive development outcomes across Kumbungu District.

Table 17: Prioritised and costed adaptation actions – Gender and Social Inclusion Sector

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
1	100	Support Women-Led Cooperatives and Climate-Resilient Enterprises	Strengthen 10 women-led cooperatives engaged in shea processing, agro-processing and other climate-resilient enterprises by providing business development services, entrepreneurship training, value addition support, one productive equipment package for each cooperative, and market linkages.	Women groups, female-headed households, women entrepreneurs	Strengthen women's economic resilience, enhance enterprise productivity and increase household incomes through climate-resilient enterprises.	- Number of women-led cooperatives supported - Number of women entrepreneurs trained - Percentage increase in enterprise productivity and income - Number of cooperatives accessing new markets	Short–Medium Term	Human, Financial, Technical and Training Materials	Gender Desk Unit / Business Advisory Centre	Department of Agriculture, Business Advisory Centre (BAC), Women's Associations, NGOs and Development Partners.	1,187,000	DACF, Women's Development Fund, Development Partners, GCF, CSR
2	99	Green Skills and Climate Livelihood Training	Deliver 10 vocational training programmes benefiting approximately 300 youth and women, covering	Youth, women, unemployed persons, vulnerable households	Improve employability, strengthen climate-resilient livelihoods and	- Number of participants trained - Percentage of trainees	Short–Medium Term	Human, Financial, Technical and Training Materials	Gender Desk Unit / National Youth Authority	TVET Institutions, Department of Agriculture, Business	754,000	Youth Employment Agency, DACF, Development

Priority	MCA Score	Adaptation Action	Project Description	Primary Beneficiaries	Objectives	Indicators of Success	Timeframe	Resources Required	Lead Institution	Collaborating Institutions	Estimated Cost (GHS)	Potential Funding Sources
			climate-smart agriculture, renewable energy technologies, waste management, green entrepreneurship and sustainable business development. Establish five demonstration farms and implement a district-wide mentorship programme to support enterprise development.		promote green enterprise development.	• applying acquired skills • Number of demonstration farms established • Number of new green enterprises created				Advisory Centre, NGOs		Partners, GCF
3	92	Alternative Livelihood Development (Briquettes and Climate Enterprises)	Support the establishment of five community-based briquette production enterprises by providing production equipment, technical training, business development support and market linkages. Each enterprise will be managed by organised women's or youth groups to promote sustainable livelihoods while reducing dependence on fuelwood and charcoal.	Women, youth groups, migrants, vulnerable households	Diversify livelihoods, reduce environmental degradation and promote climate-resilient income generation.	• Number of briquette enterprises established • Number of beneficiaries supported • Quantity of briquettes produced annually • Percentage reduction in household dependence on fuelwood and charcoal among participating communities	Medium Term	Human, Financial, Technical and Training Materials	District Assembly / Business Advisory Centre	Forestry Commission, Environmental Protection Authority (EPA), NGOs, Women's Groups, Youth Associations	296,000	DACF, Development Partners, Green Enterprise Programmes, CSR
Gender and Social Inclusion Sector Total Investment											2,237,000	

4.4 Summary of Economic Appraisal Results

The economic appraisal undertaken during Workshop 2 assessed the prioritised adaptation actions against their potential to reduce climate-related losses, strengthen resilience, benefit vulnerable populations, and provide long-term value for money. The appraisal was not intended to replace detailed cost-benefit analyses that may be required during project preparation; rather, it served as a rapid screening tool to support district-level investment planning and prioritisation (**Table 18**).

The assessment considered five key questions:

1. Does the intervention address significant climate risks identified in the CRVA?
2. Is the intervention likely to reduce future climate-related losses and damages?
3. Does the intervention generate benefits for vulnerable groups and communities?
4. Is the intervention technically and institutionally feasible within the district context?
5. Are the expected benefits likely to justify the required investment?

Overall, the appraisal indicated that all fifteen priority adaptation actions offer positive adaptation benefits and contribute to reducing the district's exposure and vulnerability to drought, flooding, water scarcity, pests and diseases, and livelihood insecurity. While some interventions require substantial upfront investment, particularly within the Infrastructure and Water Resources sectors, these investments are expected to generate long-term economic and social benefits through avoided damages, improved service delivery, enhanced productivity, and strengthened resilience.

Table 18: Summary of economic appraisal results for priority adaptation actions

Sector	Priority Adaptation Action	Economic Justification	Relative Investment Requirement	Expected Resilience Benefit
Agriculture	Climate-Smart Agriculture Training and Extension	Improves productivity, soil health, and climate resilience for large numbers of farmers at relatively low cost	Medium	High
	Small-Scale Irrigation Development and Water Management	Reduces drought-related crop losses and improves year-round production	High	High
	Agro-processing and Agricultural Value Chain Support	Reduces post-harvest losses and diversifies household incomes	Medium	High
Infrastructure	Flood Embankments and Flood Protection Infrastructure	Reduces recurring flood damage to settlements, infrastructure, and farmlands	Very High	Very High
	Climate-Proof Roads and Market Access Infrastructure	Maintains access to markets and services during climate shocks	High	High
	Drainage Rehabilitation and Improvement	Reduces flood risk and infrastructure damage in vulnerable communities	Medium	High
Health	Hygiene and Environmental Health Promotion Campaigns	Prevents disease outbreaks and reduces public health costs	Low	High
	Community-Based Malaria and Disease Control Programme	Reduces disease burden and productivity losses	Low	High

Sector	Priority Adaptation Action	Economic Justification	Relative Investment Requirement	Expected Resilience Benefit
	Climate-Sensitive Disease Surveillance and Community Health Outreach	Strengthens preparedness and early response capacity	Medium	High
Water Resources	Construction and Rehabilitation of Boreholes	Improves water security and reduces time burden on households	High	High
	Rainwater Harvesting Systems	Enhances water availability during dry periods	Medium	High
	Community Water Resource Protection and Management	Protects long-term water supply and water quality	Medium	High
Gender and Social Inclusion	Support Women-Led Cooperatives and Climate-Resilient Enterprises	Strengthens household incomes and adaptive capacity	Medium	High
	Green Skills and Climate Livelihood Training	Creates alternative livelihood opportunities and employment pathways	Medium	High
	Alternative Livelihood Development	Reduces dependence on climate-sensitive livelihoods and environmental degradation	Medium	High

The appraisal further highlighted that infrastructure-related investments account for the largest share of the overall adaptation budget due to the capital-intensive nature of flood protection, drainage, and road improvement works. However, these interventions also provide some of the highest long-term resilience benefits through avoided losses to infrastructure, housing, livelihoods, and public services. Conversely, investments in agriculture, health, water resources, and social inclusion generally require lower capital outlays while delivering broad resilience benefits across vulnerable populations.

The results therefore support a balanced adaptation portfolio that combines structural investments with capacity-building, livelihood diversification, ecosystem management, and service delivery interventions. Together, these actions provide a practical pathway for reducing climate risks while strengthening the district's long-term resilience and development outcomes.

4.5 Operations and Maintenance Considerations

The long-term effectiveness of adaptation investments depends not only on their successful implementation but also on the availability of adequate operations and maintenance (O&M) arrangements (**Table 19**). Experience from previous development projects in Kumbungu District and comparable districts in Northern Ghana indicates that insufficient maintenance planning often undermines the sustainability of infrastructure, equipment, and community-based interventions. Consequently, Workshop 2 included an assessment of the likely O&M requirements, associated risks, and institutional responsibilities for each priority adaptation action.

The assessment focused on identifying: (i) the recurring maintenance requirements associated with each intervention; (ii) the institutions responsible for oversight and maintenance; (iii) potential risks that could affect long-term functionality; and (iv) practical measures required to enhance sustainability.

Overall, the assessment found that capacity-building, awareness creation, and livelihood interventions generally have relatively low maintenance requirements, while infrastructure and water-related investments require more structured maintenance arrangements and dedicated financing mechanisms. In particular, irrigation systems, boreholes, drainage infrastructure, roads, and flood protection structures will require routine maintenance, periodic inspections, and clearly defined institutional responsibilities to ensure long-term performance.

Table 19: Summary of operations and maintenance considerations

Sector	Priority Adaptation Action	Key O&M Requirements	Lead O&M Institution	O&M Risk Level	Key Sustainability Measures
Agriculture	Climate-Smart Agriculture Training and Extension	Continued extension support, demonstration plot maintenance, refresher training	Department of Agriculture	Low	Integrate into routine agricultural extension programmes
	Small-Scale Irrigation Development and Water Management	Pump maintenance, borehole servicing, irrigation infrastructure repairs	Department of Agriculture / GIDA	High	Establish user associations, maintenance funds, and local operator training
	Agro-processing and Agricultural Value Chain Support	Cooperative management, equipment servicing, business support services	BAC / Department of Agriculture	Medium	Strengthen cooperative governance and financial management
Infrastructure	Flood Embankments and Flood Protection Infrastructure	Routine inspections, repairs, vegetation control, desilting	Works Department	High	Dedicated maintenance budgets and periodic inspections
	Climate-Proof Roads and Market Access Infrastructure	Road grading, culvert maintenance, drainage clearing	Works Department / Feeder Roads	High	Mainstream into district infrastructure maintenance programmes
	Drainage Rehabilitation and Improvement	Regular desilting, waste removal, minor repairs	Works Department / Environmental Health Unit	High	Community participation and annual maintenance schedules
Health	Hygiene and Environmental Health Promotion Campaigns	Periodic awareness campaigns and community outreach	Environmental Health Unit	Low	Integration into existing public health programmes
	Community-Based Malaria and Disease Control Programme	Community mobilisation, vector control activities, surveillance	District Health Directorate	Low	Integrate into routine disease prevention activities
	Climate-Sensitive	Data collection, reporting,	Ghana Health Service	Medium	Strengthen community

Sector	Priority Adaptation Action	Key O&M Requirements	Lead O&M Institution	O&M Risk Level	Key Sustainability Measures
	Disease Surveillance and Community Health Outreach	outreach logistics			health systems and reporting mechanisms
Water Resources	Construction and Rehabilitation of Boreholes	Pump servicing, repairs, water quality monitoring	CWSA / WATSAN Committees	High	Establish maintenance funds and local technician support
	Rainwater Harvesting Systems	Tank cleaning, gutter maintenance, repairs	District Assembly / User Groups	Medium	User training and maintenance schedules
	Community Water Resource Protection and Management	Monitoring catchment areas, water quality assessments	Water Resources Commission / WATSAN Committees	Medium	Community stewardship and enforcement of local by-laws
Gender and Social	Support Women-Led Cooperatives and Climate-Resilient Enterprises	Cooperative management and business support	Gender Desk / BAC	Medium	Continued mentoring and market linkage support
	Green Skills and Climate Livelihood Training	Refresher training and enterprise coaching	Gender Desk / National Youth Authority	Low	Integration into youth employment programmes
	Alternative Livelihood Development	Equipment maintenance and enterprise support services	District Assembly / BAC	Medium	Business incubation and access to finance support

The assessment highlights that the highest sustainability risks are associated with infrastructure, irrigation, and water supply investments due to their dependence on recurring maintenance expenditures, technical expertise, and institutional coordination. To address these risks, future project implementation should include dedicated maintenance budgets, capacity-building for local operators, and the establishment of community-based management structures where appropriate.

Conversely, interventions focused on training, awareness creation, livelihood diversification, and institutional strengthening generally present lower maintenance risks because they can be integrated into existing district programmes and service delivery systems. Ensuring that O&M considerations are incorporated during project design and budgeting will be critical for protecting adaptation investments and sustaining resilience benefits beyond the initial implementation period.

This assessment therefore reinforces the importance of moving beyond project delivery towards long-term asset management, institutional ownership, and sustainable service provision as part of the district's climate adaptation strategy.

4.6 Financing and Resource Mobilisation Strategy

Successful implementation of the Climate Adaptation Plan will depend on the District Assembly's ability to mobilise and coordinate financial resources from multiple sources. Given the scale of climate risks facing Kumbungu District and the estimated investment requirement of approximately GHS34 million, implementation cannot rely on a single funding source. Instead, a blended financing approach involving district resources, national government programmes, development partners, climate finance mechanisms, and private sector participation will be required.

It is important to note that while the SIGRA project provided technical and capacity-building support for the preparation of this Climate Adaptation Plan, it is not intended to serve as a long-term financing mechanism for implementation. Consequently, implementation of the prioritised adaptation actions will require resource mobilisation from existing government programmes, sector budgets, development partner initiatives, climate finance opportunities, and other investment sources.

The financing strategy therefore seeks to achieve four objectives:

1. Mainstream priority adaptation actions into existing district planning and budgeting processes;
2. Align adaptation investments with sector ministry programmes and ongoing development initiatives;
3. Position the district to access external climate and development finance; and
4. Encourage partnerships with development partners, NGOs, private sector actors, and community-based organisations.

4.6.1 Potential Financing Sources

Several potential financing sources were identified during Workshop 2 and subsequent review of institutional financing opportunities (**Table 20**).

Table 20: Potential financing sources for climate adaptation investments

Financing Source	Potential Application Areas
District Assembly Common Fund (DACF)	Community infrastructure, drainage improvements, awareness campaigns, institutional strengthening
Internally Generated Funds (IGF)	Co-financing of smaller adaptation initiatives and maintenance activities
Ministry of Food and Agriculture (MoFA) Programmes	Climate-smart agriculture, irrigation development, agricultural extension services
Ghana Irrigation Development Authority (GIDA)	Small-scale irrigation systems and water management infrastructure
Community Water and Sanitation Agency (CWSA)	Boreholes, water supply systems, community water management interventions
Ghana Health Service (GHS) Programmes	Disease surveillance, public health campaigns, community health outreach
Ministry of Gender, Children and Social Protection (MoGCSP)	Women's economic empowerment and social inclusion initiatives
Development Partners and NGOs	Capacity building, livelihood programmes, community resilience initiatives
Climate Finance Mechanisms (e.g., GCF, Adaptation Fund, GEF)	Large-scale adaptation investments and resilience-building projects
Corporate Social Responsibility (CSR) and Private Sector Partnerships	Community infrastructure, livelihood support, and local development initiatives

4.6.2 Financing Priorities by Sector

The financing needs vary across sectors (**Table 21**). Infrastructure investments require the largest share of resources due to the capital-intensive nature of flood protection structures, drainage systems, and climate-resilient roads. Agriculture and Water Resources interventions require a combination of capital investments and operational support, while Health and Gender and Social Inclusion interventions are primarily capacity-building and service-delivery focused and may be more suitable for integration into existing government and development partner programmes.

Table 21: Indicative financing priorities by sector

Sector	Estimated Cost (GHS)	Potential Lead Financing Sources
Agriculture	5,259,000	MoFA programmes, GIDA, Development Partners, Climate Finance Facilities
Infrastructure	22,000,000	DACF, National Infrastructure Programmes, Climate Finance Facilities, Development Partners, PPPs
Health	2,056,000	Ghana Health Service, Ministry of Health Programmes, NGOs, Development Partners
Water Resources	2,453,000	CWSA, Water Resources Commission, Development Partners, Climate Finance Facilities
Gender and Social Inclusion	2,237,000	MoGCSP Programmes, NGOs, Development Partners, CSR and Private Sector Partnerships
Total	34,005,000	Multiple Sources

4.6.3 Resource Mobilisation Considerations

To improve implementation prospects, the CAP should prioritise the integration of high-priority adaptation actions into Medium-Term Development Plans, Annual Action Plans, Composite Budgets, and sector work programmes. This will increase opportunities for accessing public funding while also strengthening the district's ability to leverage external support.

In addition, this CAP provides a platform for developing project concepts and funding proposals that can be submitted to development partners, climate finance facilities, and national investment programmes. The existence of prioritised, costed, and stakeholder-validated adaptation actions significantly improves the district's readiness to attract adaptation financing.

Overall, the financing strategy recognises that climate adaptation is not a standalone activity but a cross-sectoral development priority requiring coordinated investments across multiple institutions and funding streams. Successful implementation will therefore depend on strategic planning, resource mobilisation, partnership development, and sustained institutional commitment.

4.7 Implementation Phasing Framework

Given the scale of investment required and the varying levels of technical complexity associated with the priority adaptation actions, implementation will need to be phased over time. The phasing framework developed during Workshop 2 provides a practical roadmap for sequencing investments based on urgency, feasibility, institutional readiness, and financing requirements.

The framework recognises that some interventions can be implemented relatively quickly through existing district programmes and partnerships, while others require substantial resource mobilisation, detailed technical assessments, engineering designs, or multi-stakeholder coordination (**Table 22**). Consequently, actions were grouped into short-, medium-, and long-term implementation horizons to support integration into the Medium-Term Development Plan, Annual Action Plans, Composite Budgets, and future project proposals.

The phasing approach was guided by four considerations:

1. Urgency of the climate risk being addressed;
2. Readiness of institutions to implement the intervention;
3. Scale of financial resources required; and
4. Technical complexity and implementation timeframe.

Table 22: Implementation phasing framework for priority adaptation actions

Sector	Priority Adaptation Action	Lead Institution	Implementation Horizon	Rationale
Agriculture	Climate-Smart Agriculture Training and Extension	Department of Agriculture	Short Term (Years 1–2)	Builds adaptive capacity quickly and can be integrated into existing extension programmes
	Agro-processing and Agricultural Value Chain Support	Department of Agriculture / BAC	Short Term (Years 1–2)	Supports livelihood diversification and income generation with relatively low capital requirements
	Small-Scale Irrigation Development and Water Management	Department of Agriculture / GIDA	Medium–Long Term (Years 2–5)	Requires technical assessments, infrastructure development, and significant investment
Infrastructure	Drainage Rehabilitation and Improvement	Works Department	Short–Medium Term (Years 1–3)	Addresses immediate flood risks and can be implemented incrementally
	Climate-Proof Roads and Market Access Infrastructure	Works Department / Department of Feeder Roads	Medium–Long Term (Years 2–5)	Requires detailed engineering designs and substantial capital investment
	Flood Embankments and Flood Protection Infrastructure	Works Department	Long Term (Years 3–5+)	Large-scale infrastructure requiring extensive planning and financing
Health	Hygiene and Environmental Health Promotion Campaigns	Environmental Health Unit	Short Term (Years 1–2)	Can be integrated into ongoing public health activities
	Community-Based Malaria and Disease Control Programme	District Health Directorate	Short Term (Years 1–2)	Builds on existing health outreach systems and programmes
	Climate-Sensitive Disease Surveillance and Community Health Outreach	Ghana Health Service	Medium Term (Years 2–3)	Requires strengthening of surveillance systems and reporting structures
Water Resources	Rainwater Harvesting Systems	Water and Sanitation Unit	Short–Medium Term (Years 1–3)	Relatively low-cost intervention with

Sector	Priority Adaptation Action	Lead Institution	Implementation Horizon	Rationale
				immediate resilience benefits
	Construction and Rehabilitation of Boreholes	District Assembly / CWSA	Medium Term (Years 2–3)	Requires hydrogeological investigations, procurement, and construction
	Community Water Resource Protection and Management	Water Resources Commission / WATSAN Committees	Medium Term (Years 2–3)	Requires institutional coordination and community mobilisation
Gender and Social Inclusion	Support for Women-Led Cooperatives and Climate-Resilient Enterprises	Gender Desk / BAC	Short Term (Years 1–2)	Builds on existing community groups and livelihood structures
	Green Skills and Climate Livelihood Training	Gender Desk / National Youth Authority	Short Term (Years 1–2)	Supports rapid capacity development and employment creation
	Alternative Livelihood Development	District Assembly/ BAC	Medium Term (Years 2–3)	Requires enterprise development support and market linkages

The phasing framework indicates that several high-impact actions can be initiated within the first two years using existing institutional structures and available funding opportunities. These include climate-smart agriculture training, hygiene promotion campaigns, women's livelihood support programmes, green skills training, and drainage rehabilitation activities. Such interventions offer opportunities for early implementation and visible adaptation benefits while larger investments are being prepared.

Conversely, infrastructure-intensive interventions such as flood embankments, climate-proof roads, and irrigation systems require longer preparation periods due to their higher capital requirements, technical complexity, and need for feasibility studies, engineering designs, and external financing. Sequencing these investments allows the district to mobilise resources progressively while building implementation experience through lower-cost adaptation measures.

4.8 Chapter Summary

This chapter translated the climate risks and adaptation priorities identified through the CRVA and stakeholder engagement processes into a portfolio of fifteen costed adaptation actions across five priority sectors: Agriculture, Infrastructure, Health, Water Resources, and Gender and Social Inclusion. Through a structured process involving prioritisation, costing, economic appraisal, operations and maintenance assessment, financing analysis, and implementation planning, the district developed an investment-ready adaptation portfolio with an estimated value of GHS34 million.

The portfolio reflects the district's most pressing climate challenges, including drought, flooding, water scarcity, pests and diseases, and livelihood vulnerability, while explicitly targeting vulnerable groups such as women, youth, persons with disabilities, migrants, older persons, and smallholder farmers. The resulting actions combine infrastructure investments, livelihood support measures, capacity-building initiatives, health interventions, and water resource management activities to strengthen resilience across multiple sectors.

The chapter also demonstrated that adaptation planning extends beyond project identification to include considerations of economic viability, institutional feasibility, long-term sustainability, financing

opportunities, and implementation sequencing. Collectively, the proposed actions provide a practical framework for integrating climate adaptation into district development planning, budgeting, and resource mobilisation processes.

The next chapter presents the implementation arrangements, monitoring framework, and institutional mechanisms required to coordinate, track, and sustain delivery of the Climate Adaptation Plan over time.

5. FINANCING AND RESOURCE MOBILIZATION

5.1 Introduction

Securing adequate financing is essential for implementing the priority adaptation actions identified in this Costed Adaptation Plan. While Chapter Four presents the district's investment priorities and estimated costs, their implementation will depend on the mobilisation and effective coordination of financial resources from multiple sources.

Given the scale of the required investment, no single funding source is expected to meet the district's adaptation needs. Implementation will therefore require a combination of district resources, national government programmes, development partner support, climate finance mechanisms, private sector investment, and community contributions.

This chapter presents the financing and resource mobilisation strategy for the CAP. It identifies potential financing sources, outlines approaches for mobilising and coordinating resources, and highlights opportunities for aligning adaptation investments with district development priorities and Ghana's broader climate and development frameworks.

Specifically, the chapter:

- identifies potential financing sources for the priority adaptation actions;
- outlines a resource mobilisation strategy consistent with district priorities and institutional capacities;
- highlights opportunities to access national, development partner, and climate finance resources;
- describes approaches for integrating adaptation investments into district planning and budgeting processes; and
- provides guidance on sequencing and coordinating investments to maximise implementation and long-term sustainability.

5.2 Financing Principles Guiding the CAP

The financing and resource mobilisation strategy for the CAP is guided by six principles that promote effective, equitable, and sustainable investment in climate adaptation. These principles provide the basis for prioritising investments, mobilising resources, and coordinating implementation across sectors.

1. **Alignment with District Planning and Budgeting:** Adaptation investments should be integrated into existing district planning and budgeting processes, including sector work plans, Annual Action Plans, Composite Budgets, and future planning cycles, to strengthen ownership and improve access to public financing.
2. **Evidence-Based Investment:** Financing should prioritise adaptation actions identified through the CRVA and the district prioritisation process, ensuring that available resources address the most significant climate risks and vulnerabilities.
3. **Gender and Social Inclusion:** Resource allocation should promote equitable adaptation outcomes by prioritising interventions that strengthen the resilience of women, youth, persons with disabilities, migrants, older persons, and other vulnerable groups.
4. **Phased and Scalable Implementation:** Given resource constraints, adaptation investments should be implemented in phases, allowing priority actions to be expanded progressively as additional resources become available.
5. **Blended Financing:** Implementation should draw on multiple financing sources, including district resources, national programmes, development partners, climate finance mechanisms, private sector investment, and community contributions, recognising that no single source is sufficient to finance the CAP.

- 6. Long-Term Sustainability:** Financing decisions should consider not only initial investment costs but also operation and maintenance requirements, institutional capacity, and the long-term resilience benefits of adaptation actions.

5.3 Overview of the CAP Investment Envelope

The Kumbungu CAP requires an estimated investment of GHS 34,005,000 to implement 15 priority adaptation actions across five sectors. The investment envelope provides the basis for the financing and resource mobilisation strategy presented in this chapter by indicating the scale of investment required across sectors (**Table 23**).

Table 23: Consolidated CAP investment envelope

Sector	Number of Actions	Estimated Cost (GHS)	Share of Total Investment (%)
Agriculture	3	5,259,000	15.5
Infrastructure	3	22,000,000	64.7
Health	3	2,056,000	6.0
Water Resources	3	2,453,000	7.2
Gender and Social Inclusion	3	2,237,000	6.6
Total	15	34,005,000	100.0

The investment profile shows that **Infrastructure** accounts for the largest share of the total investment, reflecting the high capital costs associated with flood protection, drainage improvement, and climate-resilient transport infrastructure. The remaining sectors require comparatively lower investments focused on strengthening livelihoods, improving essential services, enhancing adaptive capacity, and reducing social vulnerability.

The variation in investment requirements suggests the need for a differentiated financing approach. Capital-intensive infrastructure projects will require substantial external financing and longer implementation timeframes, while lower-cost interventions can be implemented progressively through district resources, sector programmes, development partner support, and other complementary financing mechanisms.

5.4 Potential Financing Sources for the Kumbungu CAP

The implementation of the CAP will require a diversified financing strategy that combines public resources, national sector programmes, development partner support, climate finance, private sector investment, and community participation. Different financing sources will be appropriate for different types of adaptation actions, depending on their scale, implementation requirements, and expected outcomes.

5.4.1 District and Local Government Financing

District resources remain the most immediate and accessible source of financing for adaptation actions, particularly those that can be integrated into routine service delivery, local infrastructure maintenance, and community development activities.

Potential sources include:

- DACF;
- IGF;
- District investment allocations through Annual Action Plans and Composite Budgets.

These resources are particularly suitable for:

- Climate-smart agriculture extension activities;
- Hygiene and environmental health campaigns;
- Community mobilisation and awareness creation;
- Drainage maintenance and rehabilitation;
- Small-scale water interventions; and
- Support for women and youth livelihood initiatives.

Strategic Priority: Mainstream priority adaptation actions into annual planning and budgeting processes to improve access to district resources.

5.4.2 National Sector Programmes and Government Agencies

Several priority actions align directly with ongoing programmes implemented by sector ministries and agencies. Leveraging these programmes provides an important pathway for reducing financing gaps and accelerating implementation. Potential institutional partners are shown on **Table 24**.

Table 24: Potential institutional partners

Institution	Potential Areas of Support
MoFA	Climate-smart agriculture, extension services, farmer training
GIDA	Small-scale irrigation and water management infrastructure
CWSA	Boreholes, rural water supply systems, WATSAN strengthening
Ghana Health Service	Disease surveillance, community health outreach, hygiene promotion
Department of Feeder Roads	Climate-resilient road improvements
Ministry of Gender, Children and Social Protection	Women's economic empowerment and livelihood support

5.4.3 Development Partner and NGO Financing

Development partners and non-governmental organisations continue to play an important role in supporting adaptation initiatives at the local level. Such support is particularly relevant for capacity-building, community resilience, livelihood diversification, and institutional strengthening interventions.

Potential areas for support include:

- Green skills training;
- Women-led cooperatives and Climate-resilient enterprises
- Alternative livelihood programmes;
- Water resource management;
- Community-based adaptation initiatives; and
- Capacity-building and awareness creation.

5.4.4 Climate Finance Opportunities

Several CAP interventions align with the objectives of international climate finance mechanisms. While direct access by the district may be limited, priority actions can be packaged into larger regional or national proposals coordinated through national institutions. Potential financing mechanisms include:

- Green Climate Fund;
- Adaptation Fund;
- Global Environment Facility;

- Climate-resilience programmes supported by multilateral development banks;
- Bilateral climate adaptation programmes.

Opportunities exist for:

- Flood protection infrastructure;
- Climate-resilient agriculture;
- Water security interventions;
- Community resilience and livelihood programmes.

5.4.5 Private Sector and Public–Private Partnerships

Private sector participation may provide additional financing and implementation support, particularly where adaptation investments generate economic benefits or improve local value chains.

Potential opportunities include:

- Agro-processing and value chain development;
- Solar-powered irrigation systems;
- Climate-resilient enterprise development;
- Renewable energy applications; and
- Community infrastructure partnerships.

Public–private partnerships should be structured to complement public investments while maintaining accountability, affordability, and equitable access to services.

5.4.6 Community Contributions and Local Resource Mobilisation

Community participation remains an important component of adaptation implementation. Although community contributions may not represent major financial investments, they can significantly improve project ownership, sustainability, and cost-effectiveness.

Potential contributions include:

- Labour;
- Local materials;
- Land contributions where appropriate;
- Participation in maintenance activities;
- Community monitoring and oversight.

Documenting these contributions can strengthen future funding proposals by demonstrating local commitment and co-financing.

5.4.7 Emerging Financing Opportunities

Over the longer term, the district may explore innovative financing approaches that support resilience-building and environmental management. These could include results-based financing mechanisms, ecosystem restoration incentives, climate risk insurance schemes, and other emerging adaptation financing instruments where institutional capacity and enabling conditions permit (**Table 25**).

While these opportunities are currently limited at district level, they may become increasingly relevant as Ghana's climate finance landscape evolves.

Table 25: Summary of potential financing sources for the Kumbungu climate adaptation plan

Financing Source	Potential Funding Instruments	Priority Investment Areas	Lead/Coordinating Institution
District and Local Government Financing	District Assemblies Common Fund; Internally Generated Funds; Annual Action Plans; Composite Budget	Community awareness and mobilisation; climate-smart agriculture extension; hygiene and sanitation campaigns; drainage maintenance; small-scale water supply; women and youth livelihood initiatives	Kumbungu District Assembly
National Sector Programmes	Sector ministry budgets and national programmes	Climate-smart agriculture; irrigation; rural water supply; feeder roads; community health; gender and livelihood programmes	Relevant Ministries, Departments and Agencies (MoFA, GIDA, CWSA, Ghana Health Service, Department of Feeder Roads, Ministry of Gender, Children and Social Protection)
Development Partners and NGOs	Bilateral and multilateral development assistance; NGO grants; technical assistance programmes	Capacity development; community-based adaptation; livelihood diversification; water resource management; women-led enterprises; institutional strengthening	Development Partners, NGOs and Kumbungu District Assembly
International Climate Finance	Green Climate Fund; Adaptation Fund; Global Environment Facility; Multilateral Development Banks; Bilateral Climate Funds	Flood protection infrastructure; climate-smart agriculture; water security; ecosystem restoration; resilience-building projects	National Designated Authorities, Sector Ministries and Development Partners
Private Sector and Public–Private Partnerships	Corporate investment; Public–Private Partnerships (PPPs); Corporate Social Responsibility (CSR); Impact investment	Solar-powered irrigation; renewable energy; agro-processing; value chain development; climate-resilient enterprises; community infrastructure	Private Sector, District Assembly and Sector Agencies
Community Contributions	Labour; local materials; land (where appropriate); community maintenance; voluntary participation	Community infrastructure; watershed management; maintenance of adaptation assets; local awareness campaigns; community monitoring	Traditional Authorities, Community-Based Organisations and Local Communities
Emerging Financing Opportunities	Results-based financing; ecosystem restoration incentives; climate risk insurance; innovative resilience financing mechanisms	Landscape restoration; ecosystem-based adaptation; disaster risk reduction; long-term resilience initiatives	District Assembly, National Government and Development Partners

5.5 Financing Strategy and Resource Mobilisation Roadmap

The financing strategy for the Kumbungu CAP is based on a phased approach that combines local resource mobilisation with external financing. District resources should support lower-cost and recurrent adaptation activities, while capital-intensive investments are progressively financed through national programmes, development partners, climate finance mechanisms, and private sector participation.

5.5.1 Strengthening Local Financing Commitment

The Kumbungu District Assembly should progressively increase local financing for adaptation by integrating priority actions into annual planning and budgeting processes and allocating available resources from the District Assemblies Common Fund, Internally Generated Funds, and other district funding sources.

Local financing should prioritise:

- co-financing requirements for externally funded projects;
- operation and maintenance of adaptation assets;
- community awareness and mobilisation activities;
- small-scale resilience interventions; and
- preparation of project proposals and investment concept notes.

Visible district investment will strengthen ownership and improve the district's ability to attract external financing.

5.5.2 Short-Term Financing Priorities (Years 1–2)

The initial implementation phase should focus on lower-cost interventions that can be financed through existing district budgets, sector programmes, and ongoing partnerships.

Priority investments include:

- climate-smart agriculture training and extension;
- hygiene and environmental health campaigns;
- women-led livelihood initiatives;
- green skills development;
- drainage maintenance; and
- rainwater harvesting.

5.5.3 Medium-Term Financing Priorities (Years 2–3)

The second phase should focus on interventions requiring moderate investment and stronger collaboration among sector agencies and development partners.

Priority investments include:

- borehole construction and rehabilitation;
- community water resource management;
- climate-sensitive disease surveillance;
- alternative livelihood programmes; and
- expansion of small-scale irrigation.

These interventions are well suited to blended financing arrangements.

5.5.4 Long-Term Financing Priorities (Years 3–5 and Beyond)

The final phase should focus on capital-intensive infrastructure requiring dedicated resource mobilisation and external financing.

Priority investments include:

- flood protection infrastructure;
- climate-resilient roads and transport infrastructure; and
- major irrigation and water management systems.

Implementation should be aligned with national infrastructure programmes, climate finance facilities, and development partner investments.

5.5.5 Resource Mobilisation Actions

To improve financing readiness, the Kumbungu District Assembly should:

1. Mainstream priority adaptation actions into district development plans and annual budgets;
2. Prepare bankable project concept notes and funding proposals;
3. Strengthen coordination with sector ministries, development partners, and climate finance institutions;
4. Establish a system for tracking adaptation-related expenditure and investment;
5. Promote partnerships with the private sector and civil society organisations; and
6. Explore innovative financing mechanisms as institutional capacity develops.

Implementing these actions will strengthen the District Assembly's capacity to mobilise, coordinate, and manage financial resources for climate adaptation while supporting the long-term implementation of the CAP. **Table 26** presents the proposed resource mobilisation roadmap for implementing the CAP. The roadmap outlines the key financing actions, indicative implementation timeframe, responsible institutions, and expected outputs required to strengthen financing readiness and support the progressive implementation of priority adaptation actions.

Table 26: Resource mobilisation roadmap for CAP implementation

Timeframe	Key Actions	Lead Institution	Expected Output
Year 1	Integrate CAP priorities into MTDP, Annual Action Plan and Composite Budget	Kumbungu District Assembly	Adaptation actions incorporated into district planning and budgeting
Year 1	Prepare concept notes and investment proposals	District Assembly with Sector Departments	Pipeline of bankable adaptation projects
Years 1–2	Engage national sector agencies and development partners	District Assembly	Co-financing and technical partnerships established
Years 2–3	Submit proposals to national and international climate finance programmes	District Assembly, MESTI/EPA and Development Partners	Increased external financing for priority investments
Years 2–5	Establish expenditure tracking and monitoring system	District Assembly	Improved financial accountability and reporting
Ongoing	Mobilise community and private sector participation	District Assembly, Traditional Authorities, CSOs and Private Sector	Enhanced local ownership, co-financing and sustainability

5.6 Institutional Arrangements for Financial Management

The effective financial management of the CAP will depend on clear institutional responsibilities, coordinated implementation, and transparent financial oversight. The institutional arrangements proposed in this section are intended to strengthen resource mobilisation, financial accountability, implementation coordination, and reporting throughout the implementation period.

5.6.1 Recommended Coordination Arrangements

The District Planning Coordinating Unit (DPCU) should serve as the primary coordination mechanism for CAP implementation and financial oversight. The Planning Unit should lead the integration of priority adaptation actions into district development plans, coordinate implementation across sector departments, monitor progress, and facilitate engagement with funding partners.

The Finance Department should oversee budgeting, expenditure management, financial reporting, and compliance with public financial management procedures.

Sector departments, including Agriculture, Works, Environmental Health, Community Development, and other relevant units, should be responsible for implementing sector-specific adaptation actions within their respective mandates.

5.6.2 Collaboration with National Institutions and Development Partners

The implementation of the CAP is likely to require continued collaboration with national institutions, sector agencies, development partners, and technical organisations. Potential roles may include:

- Technical review and advisory support;
- Facilitation of access to national programmes and funding opportunities;
- Capacity strengthening and institutional support;
- Support for proposal development and resource mobilisation; and
- Alignment with national adaptation and development priorities.

Relevant institutions may include EPA, sector ministries and agencies, development partners, non-governmental organisations, and climate finance intermediaries.

5.6.3 Financial Accountability and Governance

To strengthen transparency, accountability, and effective resource utilisation, the CAP should consider the following measures:

- Tagging and tracking adaptation-related expenditures within district budgets and financial reports;
- Integrating CAP implementation indicators into existing monitoring and reporting systems;
- Establishing periodic financial and implementation review processes through the DPCU
- Promoting regular reporting to relevant Assembly structures and stakeholders; and
- Strengthening documentation and record-keeping for adaptation-related investments and financing.

These measures can help improve accountability, support future resource mobilisation efforts, and demonstrate progress in implementing adaptation priorities. **Table 27** summarises the proposed institutional roles and responsibilities for financial management and implementation of the CAP.

Table 27: Institutional roles and responsibilities for CAP financial management

Institution	Primary Responsibilities
District Assembly	Overall leadership, policy oversight, approval of budgets, mobilisation of resources and implementation oversight
District Planning Coordinating Unit (DPCU)	Coordinate CAP implementation, integrate adaptation into district planning, monitor progress, coordinate reporting and stakeholder engagement
Finance Department	Budget preparation, financial management, expenditure tracking, financial reporting and compliance
Sector Departments	Implement sector-specific adaptation actions, prepare technical budgets, monitor implementation and report progress
National Sector Agencies	Provide technical support, facilitate access to sector programmes and co-financing opportunities
Development Partners and NGOs	Financial support, technical assistance, capacity development and project implementation support
Traditional Authorities and Community-Based Organisations	Community mobilisation, local oversight, maintenance support and beneficiary engagement
Private Sector	Co-financing, technical expertise and implementation of partnership initiatives

The proposed institutional arrangements build on existing governance structures within the District Assembly, reducing the need for new institutional mechanisms while strengthening coordination, accountability, and collaboration among implementing partners.

5.7 Risks to Financing and Mitigation Measures

The successful financing of the CAP will depend on the District Assembly's ability to anticipate and manage financial and institutional risks that may affect resource mobilisation and implementation. Although some risks are beyond the direct control of the District Assembly, many can be reduced through proactive planning, stronger coordination, diversified financing, and sound financial management. **Table 28** summarises the principal financing risks identified during CAP preparation together with recommended mitigation measures.

Table 28: Key financing risks and recommended mitigation measures

Risk	Potential Implication	Recommended Mitigation Measure
Overreliance on external funding sources	Delays in implementation if donor, climate finance, or government support is unavailable	Increase integration of adaptation actions into district budgets; allocate portions of DACF and IGF to priority adaptation actions; pursue phased implementation
Limited locally generated financing	Reduced district ownership and inability to meet co-financing requirements	Strengthen mobilisation of IGF and prioritise adaptation within local expenditure planning
Weak project preparation and costing capacity	Reduced competitiveness when seeking external financing	Maintain standardised costing documentation; strengthen proposal development and project preparation capacity

Risk	Potential Implication	Recommended Mitigation Measure
Limited staff capacity for resource mobilisation and financial management	Delays in accessing and managing adaptation financing	Provide continuous capacity strengthening, technical support, and knowledge-sharing opportunities
Fragmented funding streams and institutional coordination challenges	Duplication of effort, inefficient resource use, and implementation delays	Strengthen coordination through the DPCU and promote joint planning across departments and partners
Operations and maintenance funding gaps	Deterioration of infrastructure and reduced long-term effectiveness of investments	Incorporate O&M costs into project budgets and district planning processes from the outset
Financing–implementation mismatch	Adaptation actions designed at scales that exceed available financing	Match project scope and implementation timelines to realistic financing opportunities and phased investment approaches
Changes in national funding priorities or policy directions	Reduced access to anticipated government or programme funding	Diversify financing sources and maintain alignment with evolving national development and climate priorities

The risks identified highlight the importance of adopting a flexible financing strategy that combines realistic budgeting, phased implementation, diversified financing sources, and continuous resource mobilisation. Regular review of financing opportunities, together with strengthened institutional coordination and financial oversight, will improve the district's capacity to mobilise resources and sustain implementation of the CAP over the long term.

5.8 Linking Financing to Learning and Capacity Building

The financing strategy presented in this chapter is supported by the institutional capacity developed during preparation of the CAP. The participatory planning, prioritisation, and costing processes strengthened the District Assembly's ability to integrate climate adaptation into planning, budgeting, and investment decision-making.

Key capacity outcomes include:

- improved ability to link climate risks with investment priorities;
- practical experience in adaptation costing and project prioritisation;
- strengthened understanding of financing options and resource mobilisation pathways;
- enhanced coordination among sector departments; and
- increased capacity to prepare investment-ready adaptation proposals.

The tools and approaches developed during the CAP process—including the prioritisation framework, costing templates, financing strategy, and implementation roadmap—provide practical resources that can be applied in future planning cycles, budget preparation, project development, and funding proposals.

By strengthening institutional capacity alongside investment planning, the CAP provides a foundation

5.9 Financing Gap and Prioritisation Strategy

The estimated investment requirement of GHS 34 million exceeds the level of resources that can be mobilised through routine district budgets over a single planning cycle. Closing this financing gap will therefore require phased implementation, strategic resource mobilisation, and careful prioritisation of investments based on available financing and implementation readiness.

5.9.1 Financing Gap Context

The financing gap represents the difference between the total investment required to implement the CAP and the financial resources currently available through district budgets and existing programmes. The gap is greatest in the Infrastructure Sector, where capital-intensive investments such as flood protection, climate-resilient roads, and drainage improvements account for the largest share of the investment portfolio.

Bridging this gap will require a combination of increased local financing, stronger partnerships, and access to national and international funding opportunities.

5.9.2 Investment Prioritisation Strategy

To maximise resilience outcomes while recognising financial constraints, the CAP proposes a three-tier investment strategy.

Tier 1: Immediate Implementation Priorities

Lower-cost interventions that can be financed through district resources, existing sector programmes, and current partnerships, including:

- climate-smart agriculture extension;
- hygiene and environmental health campaigns;
- green skills development;
- women-led livelihood initiatives; and
- community awareness and mobilisation.

Tier 2: Co-Financed Adaptation Investments

Moderate-cost interventions requiring blended financing from district resources, national programmes, and development partners, including:

- borehole construction and rehabilitation;
- rainwater harvesting;
- community water resource management;
- alternative livelihood programmes; and
- expansion of small-scale irrigation.

Tier 3: Strategic Infrastructure Investments

Capital-intensive infrastructure requiring dedicated external financing, including:

- flood protection infrastructure;
- climate-resilient roads; and
- major drainage rehabilitation.

5.9.3 Strategic Implications

The proposed prioritisation strategy enables the District Assembly to begin implementation using available resources while progressively mobilising financing for larger investments. It also strengthens funding readiness by demonstrating local commitment, leveraging partnerships, and aligning investment proposals with appropriate financing opportunities. By sequencing investments according to financial and institutional capacity, the district can achieve early adaptation gains while developing larger interventions into bankable projects for future financing.

Table 29 summarises the proposed investment prioritisation strategy, linking investment tiers with their financing characteristics, likely funding sources, and representative adaptation actions.

Table 29: Investment prioritisation strategy

Investment Tier	Characteristics	Typical Financing Sources	Illustrative Priority Actions
Tier 1 – Immediate Priorities	Low-cost, high-impact interventions that can commence immediately	DACF, IGF, sector budgets, ongoing district programmes	Climate-smart agriculture extension, hygiene campaigns, green skills training, women-led livelihoods, community awareness
Tier 2 – Co-financed Investments	Moderate-cost interventions requiring institutional partnerships	District resources, national programmes, development partners, NGOs	Boreholes, rainwater harvesting, community water management, irrigation expansion, alternative livelihoods
Tier 3 – Strategic Investments	High-cost, capital-intensive infrastructure requiring long-term financing	National government programmes, climate finance, development partners, multilateral development banks	Flood protection infrastructure, climate-resilient roads, major drainage systems

The prioritisation strategy provides a practical framework for sequencing investments according to available resources while ensuring that immediate resilience gains are achieved without losing sight of longer-term infrastructure requirements.

5.10 Chapter Summary

This chapter presented the financing and resource mobilisation framework for implementing the Kumbungu CAP. It identified potential financing sources, outlined a phased resource mobilisation strategy, and proposed institutional arrangements to support the financing, coordination, and implementation of priority adaptation actions.

The chapter emphasised that achieving the CAP's investment objectives will require a diversified financing approach that combines district resources with national programmes, development partner support, climate finance mechanisms, private sector participation, and community contributions. It also highlighted the importance of strengthening local resource mobilisation, integrating adaptation into routine planning and budgeting processes, and developing investment-ready projects to attract external financing.

Finally, the chapter underscored the need for sound financial governance, effective institutional coordination, and phased investment to bridge the financing gap and sustain implementation over the long term.

The next chapter presents the institutional arrangements for implementation, monitoring, evaluation, learning, and reporting to guide the effective delivery of the CAP.

6. IMPLEMENTATION, MONITORING AND GOVERNANCE ARRANGEMENTS

6.1 Introduction

The successful implementation of the CAP will depend on effective institutional coordination, clear implementation responsibilities, and robust systems for monitoring, reporting, learning, and adaptive management. This chapter presents the governance and implementation framework for coordinating delivery of the CAP and tracking progress towards its intended outcomes.

The framework builds on existing district planning, budgeting, monitoring, and reporting systems rather than creating parallel institutional structures. It clarifies the roles and responsibilities of key institutions, establishes arrangements for implementation and oversight, and outlines mechanisms for monitoring progress, reporting results, and incorporating lessons into future planning and decision-making.

The framework is guided by five principles:

- **Implementation-focused**, ensuring the effective delivery of priority adaptation actions;
- **Results-oriented**, with clear mechanisms for tracking progress and performance;
- **Learning-based**, supporting continuous improvement and adaptive management;
- **Gender-responsive and inclusive**, ensuring that adaptation benefits reach vulnerable groups; and
- **Institutionally integrated**, strengthening existing district systems and promoting long-term ownership.

The sections that follow present the institutional arrangements, implementation mechanisms, monitoring and evaluation framework, reporting requirements, and learning processes required to support the effective implementation of the CAP.

6.2 Implementation Arrangements for the CAP

6.2.1 Phased Implementation Approach

The implementation of the CAP should follow a phased approach that reflects investment priorities, institutional readiness, and resource availability. This approach enables the District Assembly to commence lower-cost, high-priority interventions while progressively preparing and mobilising resources for more complex investments. **Table 30** presents the proposed phased implementation framework.

Table 30: Phased implementation framework

Phase	Indicative Timeframe	Primary Focus
Phase 1	Years 1–2	Quick-win interventions, capacity strengthening, community-based adaptation actions, and integration of adaptation priorities into district planning and budgeting processes
Phase 2	Years 2–3	Expansion of sectoral adaptation interventions, implementation of medium-scale investments, and strengthening of institutional coordination mechanisms
Phase 3	Years 3–5 and beyond	Implementation and scaling of major infrastructure investments, consolidation of lessons learned, and mainstreaming of adaptation into long-term development planning

The phased approach provides a practical framework for sequencing adaptation investments according to implementation readiness and financing availability. Early phases focus on community-based and capacity-building interventions that can be delivered through existing programmes, while later phases prioritise larger infrastructure investments requiring additional technical preparation and external financing.

6.2.2 Institutional Roles and Responsibilities

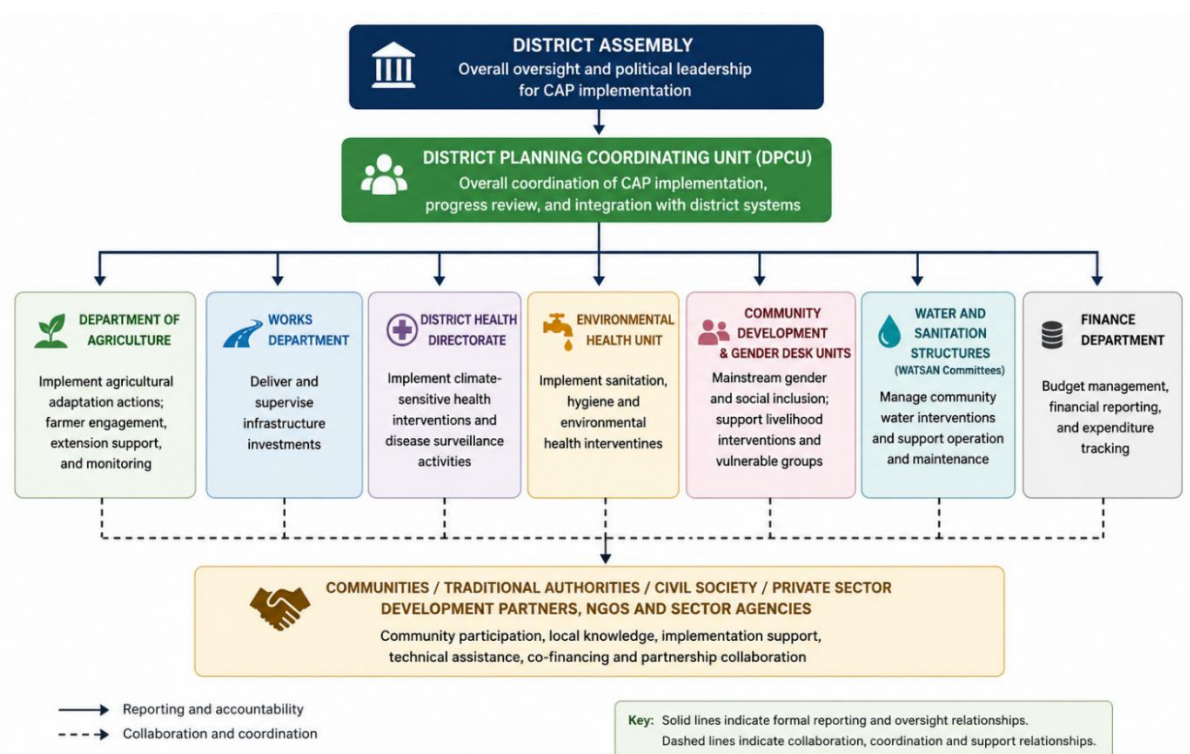
The effective implementation of the CAP will depend on coordinated action across the District Assembly, sector departments, national institutions, development partners, and local communities. The institutional arrangements proposed in this section builds on existing district governance structures and assign clear responsibilities for implementation, coordination, monitoring, and reporting. **Table 31** summarises the recommended institutional roles for CAP implementation.

Table 31: Recommended institutional roles for CAP implementation

Institution / Unit	Recommended Responsibilities
District Planning Unit	Overall coordination of CAP implementation; integration into district planning; progress reporting; stakeholder coordination
Finance Department	Budget management, financial reporting, expenditure tracking
Department of Agriculture	Implement agricultural adaptation actions; farmer extension and monitoring
Works Department	Deliver and supervise infrastructure investments
Environmental Health Unit	Implement sanitation, hygiene and environmental health interventions
District Health Directorate	Deliver climate-sensitive health interventions and disease surveillance
Community Development and Gender Desk Units	Mainstream gender and social inclusion; support livelihood interventions
Water and Sanitation Structures (WATSAN Committees)	Manage community water interventions and support operation and maintenance
District Planning Coordinating Unit (DPCU)	Review implementation progress; coordinate cross-sector implementation; oversee monitoring
Development Partners, NGOs and Sector Agencies	Provide technical assistance, co-financing and implementation support

Figure 1 illustrates the proposed governance framework for implementing the Climate Adaptation Plan, showing the reporting relationships, coordination mechanisms, and institutional responsibilities required to support effective implementation across the District Assembly and its partner institutions.

Figure 1: Proposed governance framework for the implementation of the Kumbungu climate adaptation plan



The governance framework builds on existing institutional structures within the District Assembly, with the DPCU serving as the central coordination mechanism for CAP implementation. Sector departments retain responsibility for implementing adaptation actions within their respective mandates, while development partners, civil society organisations, traditional authorities, and local communities provide complementary technical, financial, and implementation support. This arrangement strengthens coordination, promotes accountability, and avoids the creation of parallel institutional structures.

6.3 Monitoring Framework

6.3.1 Purpose of Monitoring

The monitoring framework is intended to support the effective implementation of the CAP by providing timely information on implementation progress, resource utilisation, results, and emerging challenges. Monitoring should inform management decisions, strengthen accountability, and enable adaptive implementation.

Specifically, monitoring should:

- track progress against agreed targets, timelines, and budgets;
- identify implementation challenges and resource constraints;
- assess whether adaptation investments are reaching intended beneficiaries;
- strengthen accountability for the use of financial and technical resources; and
- inform adjustments to implementation priorities and work plans.

6.3.2 Recommended Monitoring Levels

This CAP should be monitored at four complementary levels to provide information for operational management and strategic oversight. **Table 32** presents the recommended monitoring levels.

Table 32: Recommended monitoring levels for the CAP

Monitoring Level	Primary Focus
Activity Level	Completion of planned activities and implementation milestones
Output Level	Delivery of tangible products, services, and infrastructure
Outcome Level	Changes in resilience, service access, livelihoods, and adaptive capacity
Portfolio Level	Overall CAP performance, financial utilisation, implementation balance across sectors, and progress towards resilience objectives

The proposed monitoring levels are intended to complement existing district monitoring and reporting systems rather than create additional parallel structures.

6.3.3 Core Monitoring Indicators

A concise set of indicators is recommended to monitor implementation progress, financial performance, institutional effectiveness, inclusion, service delivery, and resilience outcomes. **Table 33** presents the proposed indicator categories.

Table 33: Core monitoring indicator categories

Indicator Category	Illustrative Indicators
Implementation Progress	Percentage of priority actions implemented according to schedule
Financial Performance	Percentage of planned adaptation expenditure committed and utilised
Service and Infrastructure Delivery	Number of adaptation assets delivered and operational (e.g., boreholes, irrigation facilities, drainage improvements)
Gender and Social Inclusion	Percentage of beneficiaries who are women, youth, persons with disabilities, migrants, or other vulnerable groups
Institutional Performance	Number of departments integrating adaptation actions into annual plans and budgets
Resilience and Livelihood Outcomes	Changes in agricultural productivity, water access, livelihood diversification, or other sector-specific resilience outcomes

6.3.4 Data Collection and Reporting

Monitoring information should be collected primarily through existing district systems and sector reporting mechanisms, supplemented where necessary by project-specific monitoring activities. **Table 34** summarises the principal data sources and institutional responsibilities.

Table 34: Data collection methods and responsibilities

Data Source / Method	Lead Responsibility
Administrative records and progress reports	DPCU and sector departments
Field inspections and site visits	Works Department, Department of Agriculture, Environmental Health Unit, District Health Directorate
Contractor and implementation reports	Relevant implementing departments
Community feedback and stakeholder consultations	Assembly Members, Community Structures, CSOs
Financial reports and expenditure records	Finance Department
Sector monitoring systems	Relevant sector departments and agencies

Where feasible, CAP monitoring should be integrated into existing district monitoring and reporting processes to minimise duplication. A detailed monitoring matrix, including indicator definitions, baselines, targets, reporting frequencies, and institutional responsibilities, is provided in **Annex E**.

6.4 Evaluation Framework

6.4.1 Purpose of Evaluation

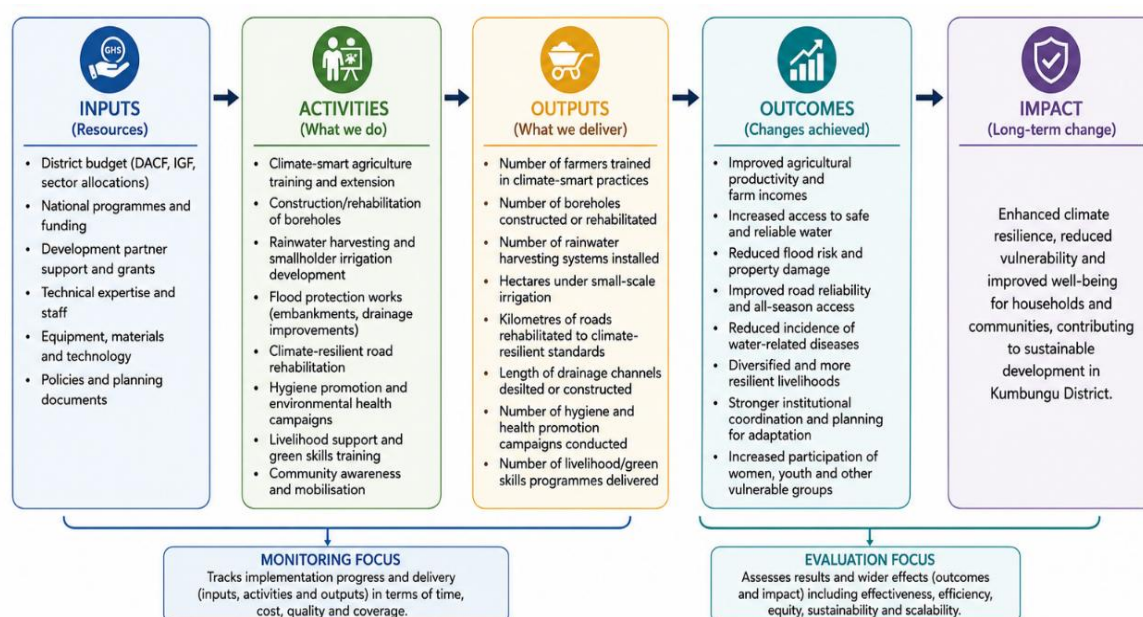
The evaluation framework complements routine monitoring by assessing the effectiveness, efficiency, sustainability, and overall outcomes of adaptation investments. Evaluation provides evidence on what has worked, what has not, and how future adaptation planning and investment can be improved.

Figure 2 illustrates the results-based monitoring and evaluation framework adopted for the CAP, showing how monitoring focuses on inputs, activities, and outputs, while evaluation assesses outcomes and long-term impacts. The framework also demonstrates the logical pathway through which adaptation investments contribute to enhanced climate resilience in Kumbungu District.

Key evaluation questions include:

- Which interventions delivered the greatest resilience benefits?
- Which implementation approaches were most effective?
- Did investments provide value for money?
- Were benefits equitably distributed among vulnerable groups?
- Which interventions are suitable for scaling or replication?

Figure 2: Results-based monitoring and evaluation framework for the Kumbungu climate adaptation plan



6.4.2 Recommended Evaluation Schedule

Periodic evaluations should be undertaken at key stages of implementation to support learning and adaptive management. **Table 35** presents the recommended evaluation schedule.

Table 35: Recommended evaluation schedule

Evaluation Type	Indicative Timing	Purpose
Mid-Term Review	End of Year 2	Assess implementation progress, identify challenges, and inform adjustments to implementation approaches and resource allocation
End-of-Plan Evaluation	End of Year 3 (or conclusion of implementation cycle)	Assess overall effectiveness, outcomes, sustainability, and lessons learned

Evaluations should combine quantitative performance information with qualitative evidence from implementing institutions, beneficiaries, and other stakeholders.

6.4.3 Recommended Evaluation Criteria

Evaluation should be guided by the following criteria:

- **Relevance** – alignment with priority climate risks and local needs;
- **Effectiveness** – achievement of intended outputs and outcomes;
- **Efficiency** – value achieved relative to resources invested;
- **Equity and Inclusion** – extent to which vulnerable groups benefit;
- **Sustainability** – likelihood that benefits will continue beyond project implementation; and
- **Scalability** – potential for successful interventions to be replicated or expanded.

Applying these criteria will strengthen accountability, generate lessons for future adaptation planning, and support continuous improvement.

6.5 Learning and Adaptive Management

6.5.1 Learning Objectives

The learning framework is intended to strengthen the District Assembly's capacity to improve climate adaptation planning and implementation over time. Systematic learning from implementation experience will support continuous improvement, strengthen institutional capacity, and inform future investment decisions.

The key objectives are to:

- improve adaptation planning, costing, and resource mobilisation;
- strengthen implementation effectiveness across sectors;
- promote gender-responsive and socially inclusive adaptation;
- identify good practices for replication and scaling; and
- inform future planning, budgeting, and investment decisions

6.5.2 Recommended Learning Mechanisms

Continuous learning should be supported through structured knowledge-sharing and reflection processes. **Table 36** presents the recommended learning mechanisms.

Table 36: Recommended learning mechanisms

Mechanism	Purpose
Annual reflection sessions	Review implementation progress, challenges, emerging risks, and lessons learned
Learning briefs	Document and communicate key findings for decision-makers and stakeholders

Mechanism	Purpose
Cross-district knowledge exchange	Facilitate sharing of experiences and good practices with other districts and partners
Documentation of case studies	Capture examples of successful interventions, implementation challenges, and lessons learned
Stakeholder review meetings	Promote dialogue among implementing departments, communities, and partners

The lessons generated through these mechanisms should inform district planning and budgeting while also contributing to knowledge sharing with national institutions, development partners, and other stakeholders.

6.5.3 Adaptive Management

The CAP should be implemented as a living framework that can be updated in response to changing climate risks, financing opportunities, implementation experience, and emerging evidence.

Monitoring, evaluation, and learning should therefore be used to:

- revise annual work plans and implementation schedules;
- adjust investment priorities where necessary;
- reallocate resources to high-performing interventions;
- improve underperforming activities; and
- inform future planning and budgeting cycles.

Embedding adaptive management within CAP implementation will help ensure that adaptation investments remain relevant, effective, and responsive to evolving district needs.

6.6 Gender and Social Inclusion Considerations

Gender and social inclusion should be mainstreamed throughout the implementation, monitoring, evaluation, and learning processes of the CAP. Particular attention should be given to ensuring that women, youth, persons with disabilities, migrants, older persons, and other vulnerable groups benefit equitably from adaptation investments.

To support inclusive implementation, the District Assembly should:

- collect and analyse sex-, age-, and vulnerability-disaggregated data where feasible;
- monitor the equitable distribution of adaptation benefits;
- ensure the participation of vulnerable groups in monitoring, evaluation, and learning activities; and
- identify and address barriers to participation and access.

The Gender Desk, Community Development Unit, and relevant sector departments should provide technical guidance on gender and social inclusion and support corrective actions where disparities are identified. Integrating these considerations throughout implementation will strengthen both climate resilience and equitable development outcomes.

6.7 Reporting and Governance Arrangements

6.7.1 Reporting Arrangements

The reporting framework is intended to support implementation oversight, accountability, and evidence-based decision-making while building on existing district planning and performance management systems. Wherever possible, CAP reporting should be integrated into established district reporting processes to minimise duplication. **Table 37** presents the recommended reporting and review framework.

Table 37: Recommended reporting and review framework

Reporting / Review Process	Indicative Frequency	Lead Responsibility	Primary Audience
Implementation Progress Report	Quarterly	Lead Implementing Departments	DPCU and District Management
Financial Progress Report	Quarterly	Finance Department	DPCU and District Management
CAP Progress Review	Biannual	DPCU	District Assembly and Sector Departments
Annual Adaptation Performance Review	Annual	DPCU and Sector Departments	District Assembly and Stakeholders
Adaptation Integration into Annual Action Plans and Composite Budgets	Annual	Planning Unit and Finance Department	District Assembly
Adaptation Integration into MTDP Reviews and Preparation Processes	Aligned with MTDP review and preparation cycles	DPCU	District Assembly and Relevant Stakeholders

The reporting framework combines implementation progress, financial performance, and strategic reviews to support informed decision-making and continuous improvement throughout the implementation period.

6.7.2 Governance and Oversight

The governance arrangements should utilise existing district coordination structures, with the District Planning Coordinating Unit serving as the primary oversight mechanism for CAP implementation.

The DPCU should:

- review implementation progress across sectors;
- identify implementation bottlenecks and resource needs;
- coordinate implementing departments and partners;
- review monitoring and evaluation findings; and
- guide the integration of adaptation priorities into future district planning and budgeting processes.

Periodic stakeholder review meetings should complement these functions by promoting dialogue, accountability, and shared learning.

6.7.3 Accountability and Transparency

Accountability should be supported through routine financial and performance reporting, systematic monitoring of agreed indicators, documentation of implementation experience, and regular stakeholder engagement.

The District Assembly should:

- maintain records of adaptation-related expenditure;
- monitor progress against agreed indicators;
- communicate implementation progress to stakeholders;
- document lessons learned; and
- periodically review CAP priorities in response to emerging climate risks and development needs.

Together, these measures will strengthen transparency, institutional ownership, and public accountability throughout implementation.

6.8 Capacity Development Priorities

The successful implementation of the CAP will depend on strengthening institutional capacity alongside financial and technical resources. While the CAP preparation process demonstrated considerable local knowledge and technical expertise, additional capacity development will support more effective implementation, coordination, monitoring, and resource mobilisation. **Table 38** identifies the priority areas for capacity development.

Table 38: Priority capacity development areas for CAP implementation

Capacity Area	Priority Focus
Adaptation Planning and Mainstreaming	Integration of climate adaptation into planning, budgeting, and development programmes
Costing and Financial Management	Activity-based costing, budget preparation, expenditure tracking, and financial reporting
Resource Mobilisation	Proposal development, partnership building, and access to adaptation financing opportunities
Monitoring, Evaluation and Learning	Indicator tracking, data management, reporting, and evidence-based decision-making
Gender and Social Inclusion	Practical approaches for integrating inclusion considerations into implementation and monitoring
Infrastructure Management	Technical supervision, quality assurance, operations and maintenance planning
Cross-Sector Coordination	Joint planning, implementation, reporting, and stakeholder engagement

Capacity development should be closely linked to implementation through practical approaches such as mentoring, on-the-job coaching, peer learning, technical backstopping, and targeted training. Strengthening these capacities will improve implementation effectiveness, financial management, cross-sector coordination, and the long-term sustainability of adaptation investments.

Table 39 provides a consolidated overview of the governance and implementation framework for the CAP, summarising the principal implementation components, their primary functions, and the institutions responsible for coordinating their delivery. The table serves as a practical reference for understanding how the different elements of the implementation framework work together to support effective coordination, monitoring, learning, and accountability.

Table 39: Summary of the CAP implementation framework

Component	Primary Purpose	Lead Institution
Governance	Strategic oversight and coordination	District Assembly / DPCU
Implementation	Delivery of adaptation actions	Sector Departments
Monitoring	Track implementation progress	DPCU & Sector Departments
Evaluation	Assess effectiveness and outcomes	DPCU with Stakeholders
Learning	Capture and apply lessons	DPCU & Sector Departments
Reporting	Performance and financial reporting	Planning Unit & Finance Department
Capacity Development	Strengthen implementation capability	District Assembly & Development Partners

The implementation framework demonstrates that successful delivery of the CAP depends on coordinated action across multiple institutions, supported by clearly defined roles and complementary implementation functions. By integrating governance, implementation, monitoring, evaluation, learning,

reporting, and capacity development within existing district systems, the framework strengthens institutional ownership and promotes the long-term sustainability of climate adaptation interventions.

6.9 Chapter Summary

This chapter presented the institutional and governance framework for implementing the Kumbungu Costed Climate Adaptation Plan. It outlined the implementation arrangements, institutional roles and responsibilities, financing mechanisms, and monitoring, evaluation, learning, and reporting systems required to support effective implementation of the priority adaptation actions.

By integrating climate adaptation into existing district planning and budgeting processes, strengthening institutional coordination, and promoting adaptive management and stakeholder accountability, the framework provides a practical foundation for translating the Plan's priorities into coordinated action. Successful implementation will depend on sustained political commitment, adequate financing, institutional capacity, and continuous learning to ensure that adaptation investments remain responsive to evolving climate risks and local development needs.

7. CHAPTER SEVECONCLUSION, STRATEGIC WAY FORWARD AND RECOMMENDATIONS

7.1 Conclusion

7.1.1 Transitioning from Climate Risk Assessment to Adaptation Action

This Costed Climate Adaptation Plan marks an important transition in how climate risks are addressed within Kumbungu District. Building on the findings of the Climate Risk and Vulnerability Assessment and strengthened through two participatory stakeholder workshops, the CAP translates climate risks into a structured, prioritised, and investment-ready framework for adaptation. By linking identified climate risks with practical adaptation actions, the Plan provides a clear basis for integrating climate resilience into district planning, budgeting, implementation, and resource mobilisation.

7.1.2 An Evidence-Based and Participatory Adaptation Planning Process

A major strength of the CAP lies in its evidence-based and participatory planning approach. The application of Multi-Criteria Analysis enabled stakeholders to prioritise adaptation actions using agreed criteria that considered relevance, feasibility, impact, sustainability, institutional capacity, and social inclusion. This transparent decision-making process, complemented by activity-based costing, economic appraisal, financing analysis, and implementation planning, has produced a realistic portfolio of adaptation investments that reflects both local priorities and institutional realities.

7.1.3 A Balanced and Prioritised Adaptation Investment Portfolio

The CAP identifies 15 priority adaptation actions across the Agriculture, Infrastructure, Health, Water Resources, and Gender and Social Inclusion sectors, representing an estimated investment requirement of GHS 34 million. The investment profile demonstrates that strengthening climate resilience in Kumbungu will require both large-scale infrastructure investments and lower-cost interventions that improve agricultural resilience, water security, public health, livelihoods, and social inclusion. This balanced portfolio provides opportunities for phased implementation through a combination of district resources, national programmes, development partners, climate finance, and private sector investment.

7.1.4 Strengthening Institutional Capacity for Climate Adaptation

Beyond the identification and costing of adaptation investments, the CAP has strengthened the District Assembly's capacity for adaptation planning, prioritisation, financing, implementation, and coordination. The process reinforced the importance of cross-sectoral collaboration, evidence-based decision-making, stakeholder participation, and the integration of climate adaptation into routine district planning and budgeting processes. These institutional gains provide an important foundation for sustaining adaptation efforts beyond the preparation of the CAP.

7.1.5 Establishing a Framework for Implementation and Continuous Learning

The CAP provides more than a portfolio of adaptation investments; it establishes a practical framework for implementation, monitoring, evaluation, learning, reporting, and adaptive management. By building on existing district governance and planning systems, the framework promotes accountability, coordination, and continuous improvement while enabling the District Assembly to respond to evolving climate risks, development priorities, and financing opportunities. Treating the CAP as a living implementation framework will help ensure that adaptation actions remain relevant and effective over time.

7.2 Strategic Way Forward

The completion of the Costed Climate Adaptation Plan (CAP) represents an important milestone for Kumbungu District. The next phase should focus on translating the Plan into sustained action through progressive implementation, institutional strengthening, and resource mobilisation. Given the scale of the proposed investments and the evolving nature of climate risks, implementation should be undertaken in a phased and coordinated manner that builds on existing district systems while remaining responsive to emerging priorities and financing opportunities.

7.2.1 Short-Term Priorities (1–2 Years)

The immediate focus should be on establishing the institutional and financial foundations for implementation. Priority actions include integrating the CAP into Annual Action Plans, Composite Budgets, sector work plans, and other district planning instruments. During this period, the District Assembly should also initiate lower-cost, high-impact adaptation interventions that can be financed through existing district resources while strengthening coordination, monitoring, and reporting arrangements.

7.2.2 Medium-Term Priorities (3–5 Years)

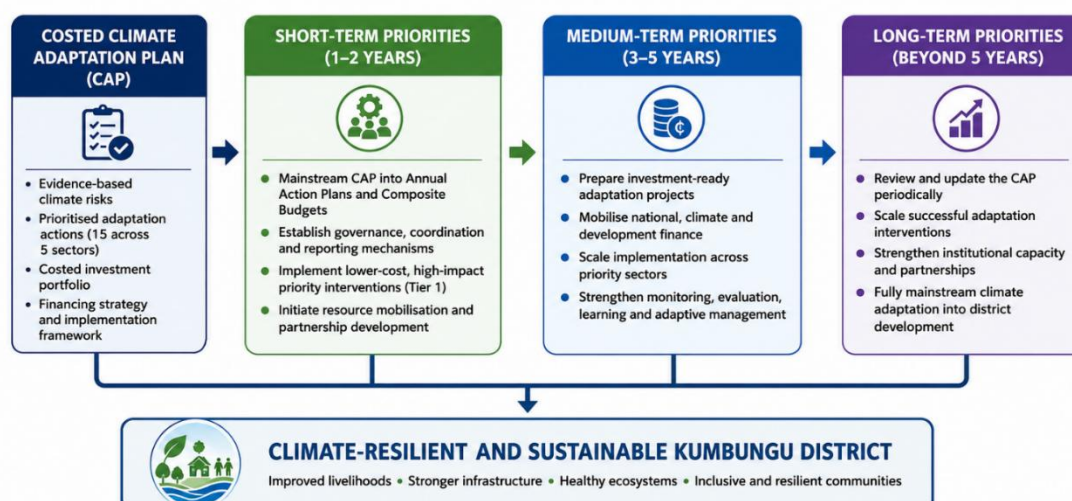
The medium term should focus on expanding implementation through increased investment and partnership development. This will require strengthening resource mobilisation efforts, preparing investment-ready projects for major infrastructure interventions, and leveraging national programmes, development partners, climate finance mechanisms, and private sector investment. Continuous monitoring, evaluation, and institutional learning should inform implementation and support adaptive management.

7.2.3 Long-Term Priorities (Beyond 5 Years)

Over the longer term, the District Assembly should focus on sustaining adaptation outcomes through periodic review and updating of the CAP, continued integration of climate adaptation into development planning, and scaling up successful interventions across the district. Long-term implementation should also strengthen institutional capacity, consolidate partnerships, and ensure that adaptation planning remains responsive to changing climate risks, socio-economic conditions, and development priorities.

Figure 3 presents the proposed strategic roadmap for implementing the Costed Climate Adaptation Plan. The roadmap illustrates the sequential priorities for translating the Plan into action through short-, medium-, and long-term implementation phases, culminating in improved climate resilience and sustainable development in Kumbungu District.

Figure 3: Strategic roadmap for the phased implementation of the Kumbungu climate adaptation plan



The roadmap emphasises that implementation should be progressive rather than simultaneous. Immediate efforts should focus on institutional integration and priority adaptation actions, followed by investment mobilisation and project implementation in the medium term, while long-term efforts should concentrate on sustaining adaptation outcomes through institutional strengthening, periodic review, and continuous mainstreaming of climate adaptation into district development processes.

7.3 Limitations of the Costed Climate Adaptation Plan

This Costed Climate Adaptation Plan has been developed using the best available climate risk information, district-level data, stakeholder consultations, and technical analyses undertaken through the Climate Risk and Vulnerability Assessment and participatory adaptation planning process. While the Plan provides a robust and practical framework for guiding climate adaptation investments in Kumbungu District, several considerations should be recognised during its implementation.

First, the investment costs presented in the Plan are indicative estimates intended to support strategic planning, budgeting, and resource mobilisation. Actual implementation costs may vary over time due to changes in market prices, inflation, engineering specifications, procurement processes, technological developments, and project design requirements. Consequently, detailed feasibility studies, engineering designs, Bills of Materials, and environmental and social assessments should be undertaken before the implementation of major infrastructure investments.

Second, climate change is characterised by uncertainty, and future climatic conditions may differ from current projections. Emerging scientific evidence, improved climate information, and changing socio-economic conditions may influence the nature, magnitude, and spatial distribution of climate risks within the Kumbungu District. Regular review of climate information will therefore be essential to ensure that adaptation priorities remain appropriate and responsive to evolving risks.

Third, successful implementation of the CAP will depend on the availability of financial resources, institutional capacity, effective coordination among implementing agencies, and sustained commitment from stakeholders. Although the Plan identifies potential financing opportunities and implementation arrangements, the timing and scale of implementation will ultimately be influenced by resource availability, policy priorities, and institutional readiness.

Finally, the CAP should be regarded as a dynamic planning and implementation framework rather than a static document. Continuous monitoring, periodic evaluation, stakeholder learning, and regular updates should be undertaken to incorporate implementation experience, emerging climate risks, new development priorities, technological innovations, and evolving financing opportunities. This adaptive approach will help ensure that the Plan remains relevant, effective, and responsive throughout its implementation period.

Recognising these limitations does not diminish the value of the Costed Climate Adaptation Plan. Rather, it underscores the importance of adaptive management, evidence-based decision-making, and periodic review to ensure that climate adaptation investments continue to strengthen the resilience of communities, livelihoods, infrastructure, and ecosystems across Kumbungu District.

7.4 Recommendations

Based on the findings of the Climate Risk and Vulnerability Assessment, the prioritisation and costing exercises, and the financing and implementation analyses, the following recommendations are proposed to support effective implementation of the Climate Adaptation Plan in Kumbungu District.

7.4.1 Mainstream Climate Adaptation into District Planning

The Kumbungu District Assembly should institutionalise climate adaptation by integrating priority CAP actions into Annual Action Plans, Composite Budgets, sector work plans, and future Medium-Term Development Plans. Embedding adaptation within existing planning and budgeting processes will

ensure that climate resilience becomes an integral component of local development rather than a stand-alone initiative.

7.4.2 Strengthen Financing and Resource Mobilisation

The District Assembly should progressively increase local financing for adaptation through the District Assembly Common Fund (DACF), Internally Generated Funds (IGF), and other available financing windows. At the same time, priority interventions should be positioned for support under national programmes, climate finance mechanisms, development partner initiatives, and private sector investment. Developing a diversified financing portfolio will reduce dependence on a single funding source and improve implementation continuity.

7.4.3 Develop Investment-Ready Adaptation Projects

Strategic adaptation investments, particularly major infrastructure interventions, should be supported through detailed feasibility studies, engineering designs, Bills of Materials, environmental assessments, and comprehensive project proposals. Strengthening project preparation will improve implementation readiness and increase the likelihood of attracting external financing.

7.4.4 Strengthen Implementation, Coordination and Accountability

Effective implementation will depend on strong coordination among sector departments, the District Planning Coordinating Unit, national agencies, development partners, and community stakeholders. Existing district governance structures should be used to coordinate implementation, monitor progress, address implementation challenges, and promote accountability across all sectors involved in delivering the CAP.

7.4.5 Promote Inclusive and Equitable Climate Adaptation

Implementation should ensure that adaptation investments respond to the needs of women, youth, persons with disabilities, migrants, older persons, and other vulnerable groups identified during the planning process. Gender-responsive planning, equitable benefit sharing, and meaningful stakeholder participation should remain central considerations throughout implementation, monitoring, and evaluation.

7.4.6 Strengthen Monitoring, Learning and Adaptive Management

The District Assembly should implement a robust monitoring, evaluation, learning, and adaptive management system to assess implementation progress and inform decision-making. Monitoring information should be used to improve resource allocation, strengthen implementation performance, document lessons learned, and periodically review and update the CAP in response to changing climate risks and development priorities.

7.4.7 Invest in Long-Term Institutional Capacity

Sustained implementation of the CAP will require continuous investment in institutional capacity. Priority areas include climate-responsive planning, adaptation finance, project preparation, costing and budgeting, infrastructure management, monitoring and evaluation, and cross-sector coordination. Capacity development should be delivered through mentoring, technical backstopping, peer learning, and targeted training programmes to strengthen the District Assembly's long-term ability to plan, finance, implement, and sustain climate adaptation interventions.

7.5 Final Reflection

The Costed Climate Adaptation Plan represents an important commitment by the Kumbungu District Assembly to move from understanding climate risks to implementing practical adaptation solutions.

While the Plan provides a clear framework for action, its success will ultimately be measured not by the quality of the document itself, but by the extent to which its priorities are translated into sustained investments, coordinated implementation, and measurable improvements in the resilience of communities, livelihoods, infrastructure, and ecosystems.

Climate change will continue to shape the District's development trajectory. Responding effectively will require sustained leadership, strong partnerships, adequate financing, and a commitment to continuous learning and adaptation. By embedding climate resilience within routine planning and development processes, Kumbungu District has an opportunity to reduce future climate risks while advancing inclusive and sustainable development.

This CAP should serve as a catalyst for long-term action rather than an end in itself. As new challenges, opportunities, and knowledge emerge, the District Assembly and its partners should continue to refine their approaches, strengthen institutional capacity, and build on the progress achieved through implementation. In doing so, Kumbungu District will be better positioned to safeguard development gains, protect vulnerable populations, and foster a resilient and prosperous future for present and future generations.

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ANNEXES

Annex A – Long List of Adaptation Measures Generated During Workshop 1

During Workshop 1, participants reviewed the Climate Risk and Vulnerability Assessment findings and generated a comprehensive long list of potential adaptation measures. These measures were subsequently screened and prioritised through the Multi-Criteria Analysis (MCA) process, resulting in the fifteen priority adaptation investments included in the Costed Adaptation Plan.

✓ = Shortlisted; — = Not shortlisted.

A1. Agriculture Sector

Adaptation Measure	Climate Risk Addressed	Shortlisted	Screening Outcome
Climate-Smart Agriculture (CSA) Training and Extension	Drought, erratic rainfall	✓	Selected as Priority Investment B1
Small-Scale Irrigation Development and Water Management	Drought, prolonged dry spells	✓	Selected as Priority Investment B2
Agro-processing and Agricultural Value Chain Support	Livelihood vulnerability, post-harvest losses	✓	Selected as Priority Investment B3
Agroforestry and On-Farm Tree Planting	Drought, land degradation	—	Integrated within CSA training and demonstration activities
Soil and Water Conservation Measures	Soil erosion	—	Incorporated within CSA and irrigation interventions
Promotion of Drought-Tolerant Crop Varieties	Drought	—	Included under CSA extension package
Integrated Pest and Disease Management	Pest outbreaks	—	Integrated within agricultural extension services
Farmer Field Demonstration Plots	Low technology adoption	—	Incorporated within the 10 demonstration farms under B1
Strengthening Agricultural Extension Services	Low adaptive capacity	—	Integrated within B1
Livelihood Diversification for Farmers	Climate-sensitive livelihoods	—	Addressed through B3

A2. Infrastructure Sector

Adaptation Measure	Climate Risk Addressed	Shortlisted	Screening Outcome
Flood Embankments and Flood Protection Infrastructure	Flooding	✓	Selected as Priority Investment B4
Climate-Proof Roads and Market Access Infrastructure	Flooding, transport disruption	✓	Selected as Priority Investment B6
Drainage Rehabilitation and Improvement	Flooding	✓	Selected as Priority Investment B5

Adaptation Measure	Climate Risk Addressed	Shortlisted	Screening Outcome
Culvert Expansion and Rehabilitation	Flooding	—	Incorporated within climate-proof road investments
Community Flood Early Warning Systems	Flooding	—	Recommended for future programming
Climate-Resilient Public Buildings	Extreme weather	—	Deferred due to funding constraints
Bridge Rehabilitation	Flooding	—	Incorporated within road resilience investments where applicable
Improved Solid Waste Management	Urban flooding	—	To be addressed through routine district sanitation programmes
Flood-Resilient Market Infrastructure	Flooding	—	Future investment opportunity

A3. Health Sector

Adaptation Measure	Climate Risk Addressed	Shortlisted	Screening Outcome
Hygiene and Environmental Health Promotion Campaigns	Waterborne diseases	✓	Selected as Priority Investment B8
Community-Based Malaria and Disease Control Programme	Malaria	✓	Selected as Priority Investment B9
Climate-Sensitive Disease Surveillance and Community Health Outreach	Climate-sensitive diseases	✓	Selected as Priority Investment B7
Climate and Health Awareness Campaigns	Heat and disease outbreaks	—	Integrated within health promotion campaigns
Improved Community Sanitation Facilities	Waterborne diseases	—	Future infrastructure investment
Expanded CHPS Outreach Services	Limited healthcare access	—	Integrated within disease outreach activities
Emergency Preparedness Planning	Floods	—	To be implemented through NADMO planning processes
Heat-Health Awareness Campaigns	Extreme heat	—	Integrated into public health education

A4. Water Resources Sector

Adaptation Measure	Climate Risk Addressed	Shortlisted	Screening Outcome
Construction and Rehabilitation of Boreholes	Water scarcity	✓	Selected as Priority Investment B10
Rainwater Harvesting Systems	Drought	✓	Selected as Priority Investment B11

Adaptation Measure	Climate Risk Addressed	Shortlisted	Screening Outcome
Community Water Resource Protection and Management	Water scarcity and degradation	✓	Selected as Priority Investment B12
Small Community Reservoirs	Water shortages	—	Deferred due to high capital costs
Watershed Protection	Catchment degradation	—	Integrated within B12
Groundwater Recharge Protection	Water scarcity	—	Integrated within B12
Community Water Quality Monitoring	Water contamination	—	Incorporated within B12
Solar-Powered Water Supply Systems	Water shortages	—	Future financing opportunity

A5. Gender and Social Inclusion

Adaptation Measure	Climate Risk Addressed	Shortlisted	Screening Outcome
Support for Women-Led Cooperatives and Climate-Resilient Enterprises	Livelihood vulnerability	✓	Selected as Priority Investment B13
Green Skills and Climate Livelihood Training	Youth unemployment	✓	Selected as Priority Investment B14
Alternative Livelihood Development (Briquettes and Climate Enterprises)	Climate-sensitive livelihoods	✓	Selected as Priority Investment B15
Gender-Responsive Climate Awareness Programmes	Cross-cutting vulnerability	—	Mainstreamed across all sector investments
Women's Access to Climate Finance	Adaptive capacity	—	Incorporated within cooperative development activities
Youth Entrepreneurship Support	Livelihood insecurity	—	Integrated within Green Skills Training
Capacity Building for Vulnerable Groups	Cross-cutting vulnerability	—	Mainstreamed across all implementation activities

Summary of the Long List

Sector	Long List Measures	Shortlisted
Agriculture	10	3
Infrastructure	9	3
Health	8	3
Water Resources	8	3
Gender and Social Inclusion	7	3
Total	42	15

Annex B – MCA Scoring and Prioritisation Results

B1. MCA Framework Applied During Prioritisation

The prioritisation of adaptation actions was undertaken during Workshop 1 using a Multi-Criteria Analysis (MCA) framework. The MCA provided a transparent and participatory approach for evaluating adaptation options identified through the Climate Risk and Vulnerability Assessment and stakeholder consultations. Actions were assessed against six agreed criteria to ensure that the final investment portfolio addressed the district's priority climate risks while remaining feasible, equitable, and implementable.

Table B1. MCA Criteria Used During Prioritisation

Criterion	Purpose
Relevance	Alignment with priority climate risks and vulnerability drivers
Feasibility	Practicality of implementation given district capacity and resources
Impact	Potential to reduce climate risks and strengthen resilience
Sustainability	Likelihood that benefits will be sustained over time
Gender and Social Inclusion	Contribution to equitable outcomes and support for vulnerable groups
Institutional Fit	Alignment with district mandates and implementation responsibilities

B2. Agriculture Sector Prioritisation Results

Priority Rank	Adaptation Action	MCA Score
1	Climate-Smart Agriculture Training and Extension	100
2	Small-Scale Irrigation Development and Water Management	98
3	Agro-processing and Agricultural Value Chain Support	97

Key Prioritisation Considerations

- Addresses drought, erratic rainfall, declining soil fertility, and food insecurity.
- Strengthens the resilience of smallholder farmers and farming systems.
- Enhances livelihood diversification and agricultural productivity.
- Supports women and youth participation in climate-resilient agriculture.

B3. Infrastructure Sector Prioritisation Results

Priority Rank	Adaptation Action	MCA Score
1	Flood Protection Infrastructure and Embankments	70
2	Drainage Rehabilitation and Improvement	60
3	Climate-Proof Roads and Market Access Infrastructure	42

Key Prioritisation Considerations

- Reduces flood risks and protects settlements and public infrastructure.
- Improves connectivity and access to markets during extreme weather events.
- Protects critical infrastructure and supports long-term economic resilience.

B4. Health Sector Prioritisation Results

Priority Rank	Adaptation Action	MCA Score
1	Hygiene and Environmental Health Campaigns	84
2	Community-Based Malaria Prevention	77
3	Climate-Sensitive Disease Surveillance and Community Health Outreach	75

Key Prioritisation Considerations

- Reduces the incidence of climate-sensitive diseases.
- Strengthens disease surveillance and preparedness.
- Improves sanitation, hygiene, and community health resilience.

B5. Water Resources Sector Prioritisation Results

Priority Rank	Adaptation Action	MCA Score
1	Construction and Rehabilitation of Boreholes	88
2	Rainwater Harvesting Systems	82
3	Community Water Resource Protection and Management	78

Key Prioritisation Considerations

- Improves water security during periods of drought.
- Enhances sustainable management of water resources.
- Strengthens community resilience to water scarcity.

B6. Gender and Social Inclusion Sector Prioritisation Results

Priority Rank	Adaptation Action	MCA Score
1	Support for Women-Led Cooperatives and Climate-Resilient Enterprises	100
2	Green Skills and Climate Livelihood Training	99
3	Alternative Livelihood Development (Briquettes and Climate Enterprises)	92

Key Prioritisation Considerations

- Strengthens livelihood diversification and adaptive capacity.
- Promotes equitable access to adaptation benefits.
- Supports women, youth, persons with disabilities, and other vulnerable groups.
- Contributes to inclusive and climate-resilient local economic development.

B7. Summary of the Prioritised Adaptation Portfolio

The MCA process resulted in the selection of 15 priority adaptation actions across five thematic sectors: Agriculture, Infrastructure, Health, Water Resources, and Gender and Social Inclusion. The prioritised actions reflect a balanced portfolio of investments addressing climate-resilient livelihoods, critical infrastructure, public health, water security, and social inclusion. These actions were subsequently refined through detailed activity-based costing, financing analysis, and implementation planning during Workshop 2, forming the basis of the final Climate Adaptation Plan.

Annex C – Detailed Project Profiles

Project C1. Climate-Smart Agriculture Training and Extension

Project Information	Description
Sector	Agriculture
Priority Rank	1
MCA Score	100
Estimated Cost	GHS 2,621,000
Implementation Period	Short–Medium Term
Lead Institution	Department of Agriculture
Supporting Institutions	CSIR, Ghana Meteorological Agency (GMet), Forestry Commission, Farmer-Based Organisations (FBOs), NGOs
Target Beneficiaries	Smallholder farmers, women farmers, youth farmers and farmer groups

Project Rationale: Agriculture is the backbone of livelihoods in Kumbungu District but remains highly vulnerable to recurrent droughts, erratic rainfall, prolonged dry spells and rising temperatures. The CRVA identified limited adoption of climate-smart agricultural practices, inadequate access to climate information, and weak agricultural extension services as major constraints to building resilience. This project addresses these challenges by strengthening farmers' knowledge, improving access to weather and climate advisory services, promoting demonstration-based learning, supporting agroforestry, and enhancing extension delivery. The intervention will improve farmers' capacity to adapt to climate variability while contributing to sustainable agricultural production and food security.

Project Goal: To enhance the resilience and productivity of smallholder farming systems through climate-smart agricultural practices, improved extension services, and climate information support.

Key Interventions

- Establish farmer field schools to build capacity in climate-smart agriculture.
- Strengthen climate information services through regular weather and seasonal advisory dissemination.
- Establish demonstration farms to promote practical learning and technology adoption.
- Promote agroforestry through the distribution and establishment of tree seedlings.
- Improve extension service delivery through logistical support for field officers.

Expected Outputs

- Ten (10) demonstration farms established and operational across the district to support practical learning and technology adoption.
- Approximately 1,000 farmers (including women and youth) trained in climate-smart agriculture through farmer field schools and extension activities.
- Climate and weather advisories regularly disseminated to farming communities.
- Approximately 45,000 tree seedlings distributed and established to promote agroforestry and climate-resilient farming systems.
- Agricultural extension services strengthened through improved field logistics and regular farmer advisory support.

Expected Outcomes

- Increased adoption of climate-smart agricultural practices by farming households.
- Improved agricultural productivity and resilience to climate variability.
- Enhanced access to climate information for informed farm decision-making.
- Reduced vulnerability of smallholder farmers and improved household food security.

Implementation and Financing

The Department of Agriculture will lead implementation in collaboration with CSIR, the Ghana Meteorological Agency, the Forestry Commission, Farmer-Based Organisations, NGOs and the District Assembly. Financing will be mobilised through the District Assembly Common Fund (DAF), development partners, forestry programmes and other climate finance opportunities. Implementation should be closely integrated with existing agricultural extension programmes to ensure sustainability beyond the project period.

Key Performance Indicators

Indicator	Means of Verification
Number of farmers trained	Training reports and attendance records
Number of weather advisories disseminated	GMet and Department of Agriculture records
Number of demonstration farms established	Field inspection reports
Number of tree seedlings established	Forestry Commission and field monitoring reports
Number of extension field visits conducted	Extension service reports

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
1	Climate-Smart Agriculture Training and Extension	Farmer climate resilience training, climate information services and agroforestry support	GOODS & SERVICES	Farmer field schools	30	4	12,000	1,440,000
			GOODS & SERVICES	Climate information dissemination	12	12	3,500	504,000
			CAPEX	Demonstration farms	10	1	35,000	350,000
			CAPEX	Tree seedlings	45,000	1	3	135,000
			SERVICES	Extension service delivery, field supervision and climate information dissemination	20	12	800	192,000
				Project C1 Total				2,621,000

Project C2. Small-Scale Irrigation Development and Water Management

Project Information	Description
Sector	Agriculture
Priority Rank	2
MCA Score	97
Estimated Cost	GHS 2,170,000
Implementation Period	Medium–Long Term
Lead Institution	Department of Agriculture / Ghana Irrigation Development Authority (GIDA)
Supporting Institutions	Works Department, Community Water and Sanitation Agency (CWSA), NGOs, Private Sector, Farmer-Based Organisations
Target Beneficiaries	Smallholder farmers, women farmers, youth engaged in dry-season farming, farmer groups

Project Rationale: Agricultural production in Kumbungu District is largely rain-fed and highly vulnerable to erratic rainfall, prolonged dry spells, and increasing temperatures. The Climate Risk and Vulnerability Assessment (CRVA) identified limited access to irrigation infrastructure and inadequate water storage as key constraints to year-round agricultural production and livelihood resilience. Developing small-scale irrigation systems and improving water management will reduce dependence on seasonal rainfall, support dry-season farming, enhance water-use efficiency, and improve household incomes. The project also contributes to food security, climate resilience, and more sustainable use of available water resources.

Project Goal: To strengthen agricultural resilience and improve year-round food production through sustainable small-scale irrigation development and efficient water management systems.

Key Interventions

- Install solar-powered irrigation pumping systems in priority farming communities.
- Develop boreholes to provide reliable water sources for irrigation.
- Construct water storage facilities to improve water availability during the dry season.
- Train farmers in irrigation operation, maintenance, and efficient water management practices.

Expected Outputs

- Five (5) solar-powered irrigation systems installed and operational in priority farming communities.
- Four (4) irrigation boreholes constructed to support reliable dry-season agricultural production.
- Five (5) water storage facilities established to improve water availability during the dry season.
- Farmers trained in irrigation management, operation, maintenance and efficient water-use practices.

Expected Outcomes

- Increased area under dry-season cultivation and irrigated agriculture.
- Improved agricultural productivity and household incomes.
- Reduced dependence on erratic rainfall for crop production.
- Enhanced resilience of farming communities to drought and climate variability.

Implementation and Financing

The Department of Agriculture and the Ghana Irrigation Development Authority (GIDA) will jointly coordinate implementation in collaboration with the Works Department, Community Water and Sanitation Agency (CWSA), NGOs, private sector partners, and Farmer-Based Organisations. Financing will be mobilised through national agricultural programmes, climate finance mechanisms, development partners, public-private partnerships, and District Assembly contributions. Appropriate operation and maintenance arrangements, including farmer participation and community ownership, should be established to ensure the long-term functionality of irrigation infrastructure.

Key Performance Indicators

Indicator	Means of Verification
Number of solar-powered irrigation systems installed	GIDA and District project completion reports
Number of irrigation boreholes constructed	CWSA and Works Department reports
Number of water storage facilities established	Field inspection and progress reports
Number of farmers trained in irrigation management	Training reports and attendance records
Functional status of irrigation systems	Routine monitoring and maintenance reports

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
2	Small-Scale Irrigation Development and Water Management	Dry season irrigation systems and water management support	CAPEX	Community irrigation schemes (including solar pumps, boreholes, storage tanks and distribution infrastructure)	5	1	241,000	1,205,000
			CAPEX	Borehole drilling	4	1	120,000	480,000
			CAPEX	Storage tanks	5	1	65,000	325,000
			GOODS & SERVICES	Farmer irrigation training	8	2	10,000	160,000
				Project C2 Total				2,170,000

Project C3. Agro-processing and Agricultural Value Chain Support

Project Information	Description
Sector	Agriculture
Priority Rank	3
MCA Score	95
Estimated Cost	GHS 468,000
Implementation Period	Short–Medium Term
Lead Institution	Department of Agriculture / Business Advisory Centre (BAC)
Supporting Institutions	District Assembly, Ghana Enterprises Agency (GEA), Farmer-Based Organisations (FBOs), Financial Institutions, NGOs, Private Sector
Target Beneficiaries	Smallholder farmers, women processors, youth entrepreneurs, farmer cooperatives and agribusiness enterprises

Project Rationale: Although agriculture is the dominant livelihood in Kumbungu District, limited value addition, inadequate post-harvest handling, and weak market linkages reduce farmers' incomes and increase losses, particularly during periods of high production. Climate variability further exacerbates these challenges by affecting crop quality and market stability. Strengthening agro-processing and agricultural value chains will enable farmers and local enterprises to add value to agricultural produce, reduce post-harvest losses, improve market access, and diversify income sources. The project will also create employment opportunities, particularly for women and youth, while promoting a more resilient and competitive local agricultural economy.

Project Goal: To strengthen climate-resilient agricultural value chains through improved agro-processing, enterprise development, and market access for farmers and local agribusinesses.

Key Interventions

- Establish and strengthen twenty (20) Village Savings and Loans Associations (VSLAs) to improve access to savings, credit and enterprise financing.
- Provide business development, entrepreneurship and enterprise management training for farmer groups and agro-processors.
- Improve post-harvest handling, storage and packaging to minimise losses and enhance product quality.
- Facilitate market linkages, access to finance and business advisory services for agribusiness enterprises

Expected Outputs

- Agro-processing equipment provided to targeted farmer and processor groups.
- Farmer cooperatives and agribusinesses trained in value addition and enterprise management.
- Improved post-harvest handling and storage practices adopted.
- Market and financing linkages established for local agricultural enterprises.

Expected Outcomes

- Twenty (20) VSLAs established or strengthened.
- Farmer groups, women processors and agribusiness enterprises trained in value addition and enterprise management.
- Improved post-harvest handling and storage practices adopted.
- Market and financing linkages established for local agricultural enterprises

Implementation and Financing: The Department of Agriculture and the Business Advisory Centre (BAC) will coordinate implementation in collaboration with the District Assembly, Ghana Enterprises Agency (GEA), Farmer-Based Organisations, financial institutions, NGOs and private sector actors. Financing will be mobilised through District Assembly resources, government enterprise support programmes, development partners, private sector investment and climate-resilient livelihood initiatives. The project will promote strong producer-market linkages and encourage private sector participation to ensure long-term sustainability.

Key Performance Indicators

Indicator	Means of Verification
Number of agro-processing facilities or equipment supported	Project completion and inspection reports
Number of farmers and processors trained	Training reports and attendance records
Number of agribusinesses accessing business advisory and financial services	BAC and GEA records
Reduction in post-harvest losses	Monitoring reports and beneficiary assessments
Increase in sales or income of supported enterprises	Enterprise records and project evaluation reports

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
3	Agro-processing and Agricultural Value Chain Support	Support climate-resilient agro-processing, value addition and market access	GOODS & SERVICES	Village Savings and Loan Association (VSLA) strengthening and business development support	20	1	14,400	288,000
			GOODS & SERVICES	Financial literacy training	10	2	9,000	180,000
				Project C3 Total				468,000

Project C4. Flood Protection Infrastructure and Embankments

Project Information	Description
Sector	Infrastructure
Priority Rank	1
MCA Score	70
Estimated Cost	GHS 14,200,000
Implementation Period	Long Term
Lead Institution	Works Department
Supporting Institutions	District Assembly, Hydrological Services Department, NADMO, Ghana Water Company Limited, Environmental Protection Agency (EPA), Traditional Authorities, Development Partners
Target Beneficiaries	Flood-prone communities, households, farmers, businesses, schools, health facilities and road users

Project Rationale: Flooding remains one of the most significant climate hazards affecting Kumbungu District, causing damage to homes, public infrastructure, farmlands and livelihoods while disrupting essential services and economic activities. Increasing rainfall intensity and inadequate flood control infrastructure have heightened the vulnerability of settlements located along flood-prone areas. The CRVA identified the construction of flood protection infrastructure and embankments as a priority intervention to reduce flood risks and safeguard critical assets. Investing in resilient flood protection measures will minimise disaster losses, improve community safety, protect productive land, and strengthen the district's long-term resilience to extreme rainfall events.

Project Goal: To reduce flood risk and protect vulnerable communities, infrastructure and productive land through the development of resilient flood protection infrastructure and embankments.

Key Interventions

- Construct flood protection embankments and associated flood control works in the priority flood-prone communities of Nawuni, Apayili, Zuggu and other priority locations identified through detailed engineering assessments.
- Rehabilitate and reinforce existing flood control structures where necessary.
- Protect critical public infrastructure, agricultural land and settlements from recurrent flooding.
- Integrate flood protection works with catchment management and environmental restoration measures.

Expected Outputs

- Flood protection embankments and associated flood control structures completed in the identified priority flood-prone communities.
- Existing flood control structures rehabilitated and strengthened.
- Critical infrastructure and agricultural land protected from recurrent flooding.
- Improved flood management capacity within the district.

Expected Outcomes

- Flood protection embankments and associated flood control structures completed in identified priority communities.
- Existing flood control structures rehabilitated and strengthened.
- Critical infrastructure and agricultural land protected from recurrent flooding.
- Improved district capacity for flood risk management and infrastructure maintenance.

Implementation and Financing: The Works Department will lead implementation in collaboration with the District Assembly, Hydrological Services Department, NADMO, EPA, Ghana Water Company Limited and development partners. Financing will be mobilised through the District Assembly, central government infrastructure programmes, climate adaptation funds and development partner support. Routine inspection and maintenance of embankments should be incorporated into the district's infrastructure management programme to ensure long-term effectiveness.

Key Performance Indicators

Indicator	Means of Verification
Length of flood protection embankments constructed	Engineering completion reports
Number of critical infrastructure assets protected	District infrastructure records
Number of flood-prone communities benefiting	Project monitoring reports
Reduction in reported flood damage and losses	NADMO and District Assembly records
Functionality of flood protection infrastructure	Routine inspection and maintenance reports

Budget

SN	Priority Action	Action Description/ Activity	Budget Category	Item Description	Qty	Frequenc y	Rate (GH¢)	Amount (GH¢)
1	Flood Embankments and Flood Protection Infrastructure	Flood protection infrastructure in high-risk flood zones	CAPEX	Earthworks and embankment construction	1	1	11,800,000	11,800,000
			CAPEX	Boulder protection structures	1	1	1,800,000	1,800,000
			GOODS & SERVICES	Hydrological and engineering surveys	2	1	120,000	240,000
			GOODS & SERVICES	Engineering supervision	12	1	30,000	360,000
				Project C4 Total				14,200,000

Project C5. Drainage Rehabilitation and Improvement

Project Information	Description
Sector	Infrastructure
Priority Rank	2
MCA Score	60
Estimated Cost	GHS 5,400,000
Implementation Period	Medium Term
Lead Institution	Works Department
Supporting Institutions	District Assembly, Hydrological Services Department, Environmental Health Unit, NADMO, EPA, Community-Based Organisations
Target Beneficiaries	Residents of flood-prone communities, businesses, schools, health facilities and road users

Project Rationale: Inadequate and deteriorating drainage infrastructure has contributed to frequent flooding, erosion and waterlogging in parts of Kumbungu District, disrupting transport, damaging public

infrastructure and increasing public health risks. The CRVA identified poor drainage systems as a key factor exacerbating flood impacts, particularly during periods of intense rainfall. Rehabilitating and expanding drainage infrastructure will improve stormwater management, reduce flood risks, minimise infrastructure damage and enhance environmental sanitation. The project will also contribute to safer settlements and more resilient urban and peri-urban infrastructure.

Project Goal: To reduce flood risks and improve stormwater management through the rehabilitation and expansion of resilient drainage infrastructure.

Key Interventions

- Rehabilitate drainage systems in six (6) priority flood-prone settlements through desilting, reconstruction and drainage improvement works.
- Construct priority primary and secondary drainage channels to improve stormwater conveyance.
- Undertake routine desilting, vegetation clearance and preventive maintenance of drainage infrastructure.
- Incorporate erosion control measures and environmentally sustainable drainage solutions into all drainage improvement works.

Expected Outputs

- Drainage systems rehabilitated across six priority settlements.
- Priority drainage channels constructed or expanded.
- Routine drainage maintenance programme established and operational.
- Improved stormwater conveyance capacity across vulnerable communities.

Expected Outcomes

- Reduced incidence and severity of flooding.
- Improved protection of public infrastructure and residential areas.
- Enhanced environmental sanitation and reduced waterlogging.
- Increased resilience of settlements to extreme rainfall events.

Implementation and Financing: The Works Department will coordinate implementation in collaboration with the District Assembly, Hydrological Services Department, Environmental Health Unit, NADMO and community stakeholders. Financing will be sought from the District Assembly, national infrastructure programmes, development partners and climate adaptation financing mechanisms. Regular inspection, desilting and maintenance should be institutionalised to sustain the effectiveness of the drainage network.

Key Performance Indicators

Indicator	Means of Verification
Length of drains rehabilitated or constructed	Engineering and completion reports
Number of flood-prone communities benefiting	Project monitoring reports
Reduction in reported flooding incidents	NADMO and District Assembly records
Frequency of drainage maintenance activities	Works Department maintenance records
Reduction in drainage blockages	Field inspection reports

Budget

SN	Priority Action	Action Description/ Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
2	Drainage Rehabilitation and Improvement	Settlement drainage systems and flood control measures	CAPEX	Drain excavation	6	1	450,000	2,700,000
			CAPEX	Drainage channel rehabilitation	4	1	600,000	2,400,000
			GOODS & SERVICES	Desilting operations	12	1	25,000	300,000
				Project C5 Total				5,400,000

Project C6. Climate-Proof Roads and Market Access Infrastructure

Project Information	Description
Sector	Infrastructure
Priority Rank	3
MCA Score	42
Estimated Cost	GHS 2,400,000
Implementation Period	Medium–Long Term
Lead Institution	Works Department
Supporting Institutions	Department of Feeder Roads, District Assembly, Department of Agriculture, Ministry of Roads and Highways, Development Partners
Target Beneficiaries	Farming communities, traders, transport operators, market users and the general public

Project Rationale: Climate-related flooding, erosion and poor road conditions frequently disrupt access to markets, farms and essential services in Kumbungu District. These disruptions increase transportation costs, contribute to post-harvest losses and limit access to health, education and economic opportunities. The CRVA highlighted the need to strengthen transport infrastructure to withstand climate-related hazards while improving connectivity between production areas and markets. Climate-proofing roads and market access infrastructure will improve year-round mobility, facilitate agricultural trade and enhance the resilience of critical transport networks.

Project Goal: To improve climate-resilient transport infrastructure and strengthen year-round access to markets and essential services.

Key Interventions

- Rehabilitate and climate-proof five (5) priority feeder roads serving farming communities and markets using climate-resilient engineering standards.
- Construct or rehabilitate ten (10) culverts and improve drainage crossings at flood-prone sections of the road network.
- Improve road drainage and associated resilience measures to maintain year-round accessibility.
- Strengthen routine road maintenance to improve long-term infrastructure resilience.

Expected Outputs

- Priority feeder roads rehabilitated or upgraded.
- Culverts and road drainage structures constructed or improved.
- Improved access to markets and essential services.
- Road maintenance programme strengthened.

Expected Outcomes

- Five (5) priority feeder roads rehabilitated or climate-proofed.
- Ten (10) culverts and drainage crossings constructed or rehabilitated.
- Improved year-round access between farming communities, markets and essential services.
- Road maintenance programme strengthened to support long-term infrastructure resilience.

Implementation and Financing: The Works Department will lead implementation in collaboration with the Department of Feeder Roads, the District Assembly, the Department of Agriculture and the Ministry of Roads and Highways. Financing will be mobilised through government infrastructure programmes, the District Assembly, development partners and climate-resilient infrastructure initiatives. Preventive maintenance should form an integral component of the project to preserve infrastructure investments.

Key Performance Indicators

Indicator	Means of Verification
Kilometres of roads rehabilitated or upgraded	Engineering completion reports
Number of culverts and drainage structures installed	Project progress reports

Indicator	Means of Verification
Number of communities with improved market access	District monitoring reports
Reduction in road closures during rainy seasons	Works Department records
Road condition assessment ratings	Periodic infrastructure inspections

Budget

SN	Priority Action	Action Description/ Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
3	Climate-Proof Roads and Market Access Infrastructure	Road resilience works and improved access routes	CAPEX	Climate-resilient road rehabilitation	5	1	350,000	1,750,000
			CAPEX	Climate-resilient culvert construction	10	1	65,000	650,000
				Project C6 Total				2,400,000

Project C7. Climate-Sensitive Disease Surveillance and Community Health Outreach

Project Information	Description
Sector	Health
Priority Rank	3
MCA Score	84
Estimated Cost	GHS 1,430,000
Implementation Period	Short–Medium Term
Lead Institution	District Health Directorate
Supporting Institutions	Ghana Health Service, Environmental Health Unit, NADMO, District Assembly, Community Health Committees, NGOs
Target Beneficiaries	Entire district population, with particular focus on children, pregnant women, older persons and other vulnerable groups

Project Rationale: Climate change is increasing the risk of climate-sensitive diseases through rising temperatures, flooding and changing rainfall patterns that favour the spread of vector-, water- and food-borne diseases. The CRVA identified the need to strengthen disease surveillance, early detection and community-based health promotion to improve preparedness and reduce climate-related health risks. This project will enhance surveillance systems, strengthen community outreach and improve public awareness of climate-related health threats, enabling timely response and reducing disease burden across the district.

Project Goal: To strengthen climate-sensitive disease surveillance, preparedness and community health outreach to reduce the impacts of climate-related health risks.

Key Interventions

- Strengthen surveillance and reporting systems for climate-sensitive diseases.
- Train health workers and community volunteers in climate-related disease surveillance and response.
- Conduct community health education and outreach campaigns on climate-related health risks.
- Improve disease preparedness, early warning and rapid response mechanisms.

Expected Outputs

- Disease surveillance systems strengthened across the district.
- Health personnel and community volunteers trained.
- Community outreach and health education campaigns conducted.
- Early warning and disease reporting mechanisms improved.

Expected Outcomes

- Improved early detection and response to climate-sensitive diseases.
- Increased public awareness of climate-related health risks.

- Reduced incidence and severity of climate-sensitive disease outbreaks.
- Enhanced resilience of the district health system to climate change.

Implementation and Financing: The District Health Directorate will coordinate implementation in collaboration with the Ghana Health Service, Environmental Health Unit, NADMO, the District Assembly, community health structures and development partners. Financing will be mobilised through government health programmes, development partners, climate adaptation funds and public health initiatives. Continuous monitoring and integration with existing disease surveillance systems will ensure long-term sustainability.

Key Performance Indicators

Indicator	Means of Verification
Number of health workers and volunteers trained	Training reports
Number of community outreach campaigns conducted	District Health Directorate reports
Timeliness and completeness of disease surveillance reports	Disease surveillance records
Number of communities covered by surveillance activities	Monitoring reports
Incidence of priority climate-sensitive diseases	District health information system (DHIMS) records

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GHC)	Amount (GHC)
1	Hygiene and Environmental Health Promotion Campaigns	Community hygiene, sanitation and climate-sensitive disease prevention	GOODS & SERVICES	IEC materials	1,000	1	50	50,000
			GOODS & SERVICES	Radio announcements	12	1	2,500	30,000
			CAPEX	Motorbikes for outreach	3	1	22,000	66,000
			SERVICES	Quarterly hygiene and environmental health outreach campaigns	12	4	2,500	120,000
				Project C7 Total				266,000

Project C8. Hygiene and Environmental Health Promotion Campaigns

Project Information	Description
Sector	Health
Priority Rank	1
MCA Score	81
Estimated Cost	GHS 266,000
Implementation Period	Short Term
Lead Institution	Environmental Health Unit
Supporting Institutions	District Health Directorate, District Assembly, Ghana Health Service, Community-Based Organisations, Traditional Authorities, NGOs
Target Beneficiaries	Households, schools, market users and communities across the district

Project Rationale: Climate change is increasing the risks of poor sanitation, water contamination and disease outbreaks, particularly following flooding and prolonged dry periods. The CRVA identified inadequate hygiene practices and environmental sanitation as important factors contributing to climate-related health risks. This project will strengthen community awareness and promote improved hygiene and environmental sanitation practices through sustained public education and behaviour change campaigns. The intervention will reduce the incidence of sanitation-related diseases while improving community resilience to climate-induced public health challenges.

Project Goal: To improve public health and strengthen community resilience through enhanced hygiene promotion and environmental sanitation.

Key Interventions

- Conduct district-wide hygiene and environmental sanitation campaigns.
- Promote household sanitation and safe waste management practices.
- Organise community clean-up exercises and environmental awareness programmes.
- Strengthen hygiene education in schools, markets and public institutions.

Expected Outputs

- Community hygiene campaigns implemented across the district.
- Schools and communities reached through sanitation education programmes.
- Community clean-up exercises conducted regularly.
- Increased public awareness of hygiene and environmental health practices.

Expected Outcomes

- Improved household hygiene and sanitation practices.
- Reduced incidence of sanitation-related diseases.
- Cleaner and healthier community environments.
- Increased community participation in environmental management.

Implementation and Financing: The Environmental Health Unit will coordinate implementation in collaboration with the District Health Directorate, Ghana Health Service, the District Assembly, community leaders and development partners. Financing will be sourced from the District Assembly, government health programmes and partner-supported environmental health initiatives.

Key Performance Indicators

Indicator	Means of Verification
Number of hygiene campaigns conducted	Environmental Health reports
Number of communities reached	Monitoring reports
Number of schools participating	School programme records
Participation in community clean-up exercises	Activity reports
Reduction in sanitation-related disease cases	District health records

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GHC)	Amount (GHC)
2	Community-Based Malaria and Disease Control Programme	Community malaria prevention and vector control	GOODS & SERVICES	Distribution of insecticide-treated mosquito nets	1,000	1	120	120,000
			SERVICES	Quarterly hygiene and environmental health outreach campaigns	15	1	16,000	240,000
				Project C8 Total				360,000

Project C9. Community-Based Malaria and Disease Control Programme

Project Information	Description
Sector	Health
Priority Rank	2
MCA Score	77
Estimated Cost	GHS 360,000
Implementation Period	Short–Medium Term
Lead Institution	District Health Directorate
Supporting Institutions	Ghana Health Service, Environmental Health Unit, District Assembly, Community Health Planning and Services (CHPS), NGOs
Target Beneficiaries	Children under five, pregnant women, households and communities in malaria-prone areas

Project Rationale: Malaria remains one of the leading climate-sensitive diseases in Kumbungu District, with changing rainfall patterns and increasing temperatures creating favourable conditions for mosquito breeding. The CRVA identified malaria prevention as a priority intervention to reduce climate-related health impacts and strengthen community resilience. This project will combine preventive education,

vector control measures and community mobilisation to reduce malaria transmission and improve public health outcomes, particularly among vulnerable population groups.

Project Goal: To reduce the incidence of malaria through strengthened community-based prevention and vector control interventions.

Key Interventions

- Conduct community education on malaria prevention and environmental management.
- Support distribution and proper use of insecticide-treated mosquito nets.
- Eliminate mosquito breeding sites through community-led environmental management.
- Strengthen community surveillance and early reporting of malaria cases.

Expected Outputs

- Malaria prevention campaigns conducted across target communities.
- Households supported with malaria prevention interventions.
- Community vector control activities implemented.
- Community surveillance systems strengthened.

Expected Outcomes

- Reduced malaria incidence across the district.
- Improved household adoption of malaria prevention practices.
- Increased community participation in vector control.
- Reduced climate-related disease burden.

Implementation and Financing: The District Health Directorate will coordinate implementation with the Ghana Health Service, CHPS compounds, Environmental Health Unit, District Assembly and development partners. Funding will be mobilised through government health programmes, malaria control initiatives and development partner support.

Key Performance Indicators

Indicator	Means of Verification
Number of malaria awareness campaigns conducted	District Health reports
Number of households reached	Programme monitoring reports
Number of community vector control activities completed	Field reports
Malaria incidence rate	DHIMS records
Percentage of households adopting preventive practices	Household surveys

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GHC)	Amount (GHC)
3	Climate-Sensitive Disease Surveillance and Community Health Outreach	Strengthening surveillance and outreach for climate-sensitive diseases	SERVICES	Community-based disease surveillance and outreach activities	12	1	25,000	300,000
			GOODS & SERVICES	Community outreach logistics	1	12	15,000	180,000
			GOODS & SERVICES	IEC materials	1	12	10,000	120,000
			CAPEX	Disease surveillance equipment	1	1	250,000	250,000
			CAPEX	Motorbikes for outreach	4	1	85,000	340,000
			COMPENSATION	Field allowances	20	12	500	120,000
			M&E	Monitoring and reporting	1	12	10,000	120,000
			Project C9 Total				1,430,000	

Project C10. Construction and Rehabilitation of Boreholes

Project Information	Description
Sector	Water Resources
Priority Rank	1
MCA Score	90
Estimated Cost	GHS 463,000
Implementation Period	Medium Term
Lead Institution	District Assembly / Community Water and Sanitation Agency (CWSA)

Project Information	Description
Supporting Institutions	Works Department, Water and Sanitation Management Teams (WSMTs), NGOs, Community Leaders
Target Beneficiaries	Rural communities, schools, health facilities and households with limited access to safe water

Project Rationale: Access to reliable and safe water remains a challenge for many communities in Kumbungu District, particularly during prolonged dry periods when existing water sources become unreliable. Climate variability is placing increasing pressure on groundwater resources and community water supply systems. The CRVA identified the construction and rehabilitation of boreholes as a priority adaptation measure to improve water security and reduce vulnerability to climate-induced water shortages. The project will expand access to safe and reliable water while improving public health and reducing the burden of water collection.

Project Goal: To improve year-round access to safe and reliable water through the construction and rehabilitation of climate-resilient boreholes.

Key Interventions

- Construct five (5) new boreholes in underserved communities.
- Rehabilitate five (5) existing boreholes.
- Establish or strengthen 10 community water management (WATSAN) committees.
- Strengthen community management and maintenance of water facilities.

Expected Outputs

- New boreholes constructed.
- Existing boreholes rehabilitated and operational.
- Community water management committees strengthened.
- Increased access to safe drinking water.

Expected Outcomes

- Improved water security for households and institutions.
- Reduced incidence of water-related diseases.
- Reduced time spent collecting water.
- Increased resilience to drought and seasonal water shortages.

Implementation and Financing: The District Assembly and CWSA will jointly coordinate implementation with support from the Works Department, NGOs and community water management structures. Financing will be mobilised through government water programmes, development partners and climate adaptation financing initiatives.

Key Performance Indicators

Indicator	Means of Verification
Number of boreholes constructed	Project completion reports
Number of boreholes rehabilitated	Inspection reports
Number of beneficiaries accessing safe water	Community records
Functionality rate of boreholes	Maintenance reports
Reduction in water collection time	Household surveys

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
1	Construction and Rehabilitation of Boreholes	Improve safe water access in water-stressed communities	CAPEX	Borehole drilling	5	1	65,000	325,000
			CAPEX	Borehole rehabilitation	5	1	12,000	60,000
			GOODS & SERVICES	Baseline and routine water quality testing	12	1	2,500	30,000
			COMPENSATION	Operation and maintenance support for WATSAN Committees	10	4	1,200	48,000
				Project C10 Total				463,000

Project C11. Rainwater Harvesting Systems

Project Information	Description
Sector	Water Resources
Priority Rank	2
MCA Score	86
Estimated Cost	GHS 620,000
Implementation Period	Medium Term
Lead Institution	Works Department
Supporting Institutions	District Assembly, CWSA, Ghana Education Service, Health Directorate, NGOs
Target Beneficiaries	Schools, health facilities, public institutions and rural communities

Project Rationale: Increasing rainfall variability and seasonal water shortages highlight the need for alternative water supply options within Kumbungu District. Rainwater harvesting offers a cost-effective approach to improving water availability while reducing dependence on groundwater sources. The CRVA identified rainwater harvesting as an important adaptation measure for enhancing water security in public institutions and communities. The project will promote water conservation and improve resilience to drought and prolonged dry periods.

Project Goal: To improve water security through the installation of sustainable rainwater harvesting systems in public institutions and communities.

Key Interventions

- Install 20 complete rainwater harvesting systems, each comprising roof catchments, gutters, first-flush devices, storage tank(s), conveyance pipes, fittings and associated accessories at selected schools, health facilities and community institutions.
- Construct rainwater storage tanks in strategic locations.
- Promote household and institutional rainwater harvesting.
- Train beneficiaries in system operation and maintenance.

Expected Outputs

- Rainwater harvesting systems installed.
- Water storage capacity increased.
- Beneficiaries trained in system management.
- Increased use of harvested rainwater.

Expected Outcomes

- Improved water availability during dry seasons.
- Reduced pressure on groundwater resources.
- Increased adoption of water conservation practices.
- Enhanced resilience to climate-induced water shortages.

Implementation and Financing: The Works Department will coordinate implementation in collaboration with the District Assembly, CWSA, educational and health institutions, NGOs and development partners. Funding will be mobilised through government programmes, climate adaptation funds and partner support.

Key Performance Indicators

Indicator	Means of Verification
Number of rainwater harvesting systems installed	Project reports
Additional water storage capacity created	Technical inspection reports
Number of beneficiary institutions	Monitoring reports
Percentage of systems functioning	Maintenance records
Reduction in seasonal water shortages	Beneficiary assessments

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
2	Rainwater Harvesting Systems	Installation of rainwater harvesting systems to improve water availability during dry periods	CAPEX	Rainwater harvesting systems	20	1	15,000	300,000
			GOODS & SERVICES	Community sensitisation	20	1	6,000	120,000
			GOODS & SERVICES	Maintenance support	20	4	2,500	200,000
				Project C11 Total				620,000

Project C12. Community Water Resource Protection and Management

Project Information	Description
Sector	Water Resources
Priority Rank	3
MCA Score	82
Estimated Cost	GHS 1,370,000
Implementation Period	Medium–Long Term
Lead Institution	District Assembly / Water Resources Commission
Supporting Institutions	EPA, Forestry Commission, CWSA, Traditional Authorities, Community Water Management Committees, NGOs
Target Beneficiaries	Communities dependent on rivers, streams, wetlands and groundwater resources

Project Rationale: Water resources within Kumbungu District are increasingly threatened by climate change, land degradation and unsustainable land use practices, resulting in declining water quality and reduced availability. The CRVA identified the protection and sustainable management of water resources as essential for strengthening climate resilience and safeguarding future water supplies. This project will promote integrated watershed management, community stewardship and ecosystem restoration to protect critical water sources and improve long-term water security.

Project Goal: To strengthen the sustainable management and protection of water resources through community-based conservation and integrated watershed management.

Key Interventions

- Establish and strengthen 12 WATSAN Committees to support community-based water resource management and long-term operation and maintenance.
- Establish community water resource management committees.
- Promote community education on water conservation and watershed protection.
- Strengthen enforcement of regulations protecting water resources.

Expected Outputs

- Water catchment areas restored and protected.
- Community water management committees established.
- Community awareness programmes implemented.
- Improved management of critical water resources.

Expected Outcomes

- Improved protection and sustainable management of community water resources through strengthened local governance and stewardship.
- Reduced degradation of water catchments.
- Increased community participation in water resource management.
- Enhanced resilience of water resources to climate change.

Implementation and Financing: The District Assembly and the Water Resources Commission will jointly coordinate implementation with the EPA, Forestry Commission, CWSA, traditional authorities and

community organisations. Financing will be mobilised through government environmental programmes, climate finance, watershed management initiatives and development partner support.

Key Performance Indicators

Indicator	Means of Verification
Area of water catchments restored	Environmental monitoring reports
Number of community water committees established	District records
Number of conservation awareness programmes conducted	Activity reports
Improvement in water quality indicators	Water quality monitoring reports
Reduction in degradation of protected water resources	Environmental assessment reports

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
3	Community Water Resource Protection and Management	Catchment protection, water quality monitoring and community water governance	GOODS & SERVICES	Establishment and strengthening of WATSAN Committees	12	1	15,000	180,000
			GOODS & SERVICES	Catchment protection campaigns	12	1	20,000	240,000
			GOODS & SERVICES	Community water quality surveillance and monitoring	12	1	10,000	120,000
			CAPEX	Water quality kits	10	1	15,000	150,000
			CAPEX	Catchment rehabilitation works	1	1	500,000	500,000
			COMPENSATION	Community facilitators	10	12	500	60,000
			M&E	Monitoring and reporting	1	12	10,000	120,000
				Project C12 Total				1,370,000

Project C13. Support for Women-Led Cooperatives and Climate-Resilient Enterprises

Project Information	Description
Sector	Livelihoods and Gender
Priority Rank	1
MCA Score	100
Estimated Cost	GHS 1,187,000
Implementation Period	Short–Medium Term
Lead Institution	Gender Desk
Supporting Institutions	Community Development Unit, Business Advisory Centre (BAC), Ghana Enterprises Agency (GEA), Department of Agriculture, Financial Institutions, NGOs
Target Beneficiaries	Women's groups, women-led cooperatives, female entrepreneurs and vulnerable women

Project Rationale: Women play a central role in agriculture and local economic activities in Kumbungu District but often face limited access to finance, skills development, markets and productive resources, increasing their vulnerability to climate change. The CRVA identified women's economic empowerment as a priority for strengthening household resilience and promoting inclusive adaptation. This project will strengthen women-led cooperatives and climate-resilient enterprises through capacity building, business support and improved access to finance and markets. The intervention will diversify livelihoods, increase household incomes and enhance the adaptive capacity of women and their families.

Project Goal: To strengthen the economic resilience of women through the development of climate-resilient enterprises and support for women-led cooperatives.

Key Interventions

- Strengthen 10 women-led cooperatives engaged in shea processing, agro-processing and other climate-resilient enterprises.
- Provide business development, entrepreneurship and financial management training.

- Facilitate access to start-up capital, financial services and productive assets.
- Support market linkages and value addition for women-led enterprises.

Expected Outputs

- Women-led cooperatives strengthened and operational.
- Women entrepreneurs trained in climate-resilient enterprise development.
- Improved access to financial and business support services.
- Market opportunities created for women-led enterprises.

Expected Outcomes

- Increased income and economic resilience among women.
- Expanded climate-resilient livelihood opportunities.
- Stronger participation of women in local economic development.
- Reduced household vulnerability to climate-related shocks.

Implementation and Financing: The District Gender Desk will coordinate implementation in collaboration with the Community Development Unit, BAC, GEA, Department of Agriculture, financial institutions and development partners. Financing will be mobilised through government social protection and enterprise development programmes, climate finance and donor-supported women's empowerment initiatives.

Key Performance Indicators

Indicator	Means of Verification
Number of women-led cooperatives supported	Project reports
Number of women trained	Training records
Number of enterprises established or strengthened	BAC and GEA records
Percentage increase in beneficiaries' income	Beneficiary surveys
Number of women accessing financial support	Financial institution records

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
1	Support Women-Led Cooperatives and Climate-Resilient Enterprises	Women-led enterprise support with emphasis on shea and climate-resilient value chains	CAPEX	Productive equipment for 10 women-led cooperatives	10	1	45,000	450,000
			GOODS & SERVICES	Business development training for women-led cooperatives	12	2	18,000	432,000
			GOODS & SERVICES	Branding, packaging and market development support	10	1	12,500	125,000
			COMPENSATION	Facilitator allowances	15	12	1,000	180,000
			Project C13 Total					1,187,000

Project C14. Green Skills and Climate Livelihood Training

Project Information	Description
Sector	Livelihoods and Capacity Development
Priority Rank	2
MCA Score	99
Estimated Cost	GHS 754,000
Implementation Period	Short–Medium Term
Lead Institution	Community Development Unit
Supporting Institutions	Business Advisory Centre (BAC), Ghana Enterprises Agency (GEA), Department of Agriculture, Technical and Vocational Education and Training (TVET) Institutions, NGOs
Target Beneficiaries	Youth, women, unemployed persons, farmer groups and community-based organisations

Project Rationale: Limited livelihood diversification and inadequate technical skills increase the vulnerability of households to climate change and economic shocks. The CRVA identified the development of green skills and climate-resilient livelihoods as an important strategy for improving employment opportunities while supporting environmental sustainability. This project will equip beneficiaries with practical skills in climate-smart enterprises, sustainable agriculture, renewable energy technologies and environmentally friendly business practices. The intervention will create employment opportunities, strengthen local entrepreneurship and support the transition towards a more resilient and sustainable local economy.

Project Goal: To strengthen household resilience through the development of green skills and climate-resilient livelihood opportunities.

Key Interventions

- Deliver vocational training in green enterprises and climate-smart livelihoods.
- Support entrepreneurship development and business incubation.
- Promote sustainable production technologies and resource-efficient practices.
- Facilitate access to business advisory services and employment opportunities.

Expected Outputs

- Beneficiaries trained in green skills and climate-resilient enterprises.
- New green enterprises established or supported.
- Business advisory and mentorship services provided.
- Increased adoption of sustainable livelihood practices.

Expected Outcomes

- Increased employment and self-employment opportunities.
- Improved household incomes and livelihood diversification.
- Growth of environmentally sustainable enterprises.
- Enhanced resilience of vulnerable households to climate change.

Implementation and Financing: The Community Development Unit will lead implementation in collaboration with BAC, GEA, TVET institutions, the Department of Agriculture and development partners. Financing will be mobilised through government employment programmes, youth development initiatives, climate finance and donor-supported livelihood programmes.

Key Performance Indicators

Indicator	Means of Verification
Number of beneficiaries trained	Training reports
Number of green enterprises established	Business registration records
Number of beneficiaries accessing business advisory services	BAC reports
Percentage of trainees engaged in climate-resilient livelihoods	Follow-up assessments
Percentage increase in beneficiary income	Household surveys

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GH¢)	Amount (GH¢)
2	Green Skills and Climate Livelihood Training	Green jobs for women and youth	CAPEX	Demonstration farms	5	1	50,000	250,000
			GOODS & SERVICES	Green skills and vocational training programmes	10	1	36,000	360,000
			COMPENSATION	Trainer allowances	8	12	1,500	144,000
			Project C14 Total					754,000

Project C15. Alternative Livelihood Development (Briquettes and Climate Enterprises)

Project Information	Description
Sector	Livelihoods and Natural Resource Management
Priority Rank	3
MCA Score	92
Estimated Cost	GHS 296,000
Implementation Period	Medium Term
Lead Institution	Community Development Unit
Supporting Institutions	Forestry Commission, Business Advisory Centre (BAC), Ghana Enterprises Agency (GEA), NGOs, Community-Based Organisations
Target Beneficiaries	Youth, women, farmer groups, charcoal producers and vulnerable households

Project Rationale: Dependence on unsustainable natural resource use for household income contributes to environmental degradation and increases vulnerability to climate change. The CRVA identified the promotion of alternative livelihoods as a priority intervention to reduce pressure on natural resources while creating sustainable income opportunities. This project will support the production of fuel briquettes and other climate-resilient enterprises that utilise agricultural residues and environmentally sustainable technologies. The intervention will improve household incomes, reduce dependence on wood fuel and promote sustainable natural resource management.

Project Goal: To strengthen climate-resilient livelihoods through the development of sustainable alternative enterprises and environmentally friendly income-generating activities.

Key Interventions

- Train community members in briquette production and climate-resilient enterprise development.
- Provide briquette production equipment and start-up support for five community-based briquette enterprises.
- Promote the use of agricultural residues for briquette production.
- Strengthen market linkages and business development services.

Expected Outputs

- Community members trained in alternative livelihood enterprises.
- Briquette production enterprises established and operational.
- Equipment and business support provided to beneficiaries.
- Market opportunities developed for climate-friendly products.

Expected Outcomes

- Increased household income and livelihood diversification.
- Five community briquette enterprises established and operational.
- Reduced dependence on wood fuel and unsustainable resource extraction.
- Expanded adoption of climate-friendly enterprises.
- Improved environmental sustainability and community resilience.

Implementation and Financing: The Community Development Unit will coordinate implementation in collaboration with the Forestry Commission, BAC, GEA, NGOs and community organisations. Financing will be mobilised through District Assembly resources, government livelihood programmes, climate finance and development partner support. Community ownership and continuous business mentoring will be essential to ensure the long-term sustainability of supported enterprises.

Key Performance Indicators

Indicator	Means of Verification
Number of beneficiaries trained	Training reports
Number of briquette and climate enterprises established	Project monitoring reports
Quantity of briquettes produced and marketed	Enterprise production records
Number of beneficiaries generating income from supported enterprises	Beneficiary surveys
Reduction in dependence on wood fuel among beneficiary households	Household monitoring and evaluation reports

Budget

SN	Priority Action	Action Description/Activity	Budget Category	Item Description	Qty	Frequency	Rate (GHC)	Amount (GHC)
3	Alternative Livelihood Development (Briquettes and Climate Enterprises)	Briquette production and climate enterprises	CAPEX	Briquette production equipment for five community enterprises	5	1	32,000	160,000
			GOODS & SERVICES	Production training	8	2	8,500	136,000
					Project C15 Total			

Annex D – Summary of Detailed Costing Tables

The cost estimates presented in this appendix were developed through participatory activity-based costing exercises undertaken during Workshop 2 and subsequently refined using sector-specific costing templates. Costs represent indicative planning estimates for phased implementation over the CAP implementation period.

Table D1. Summary of Costed Adaptation Actions by Sector

The quantities presented in the costing tables represent the planned implementation scope over the three-year investment period. Where final engineering designs or beneficiary selection processes are required, precise site dimensions and locations will be confirmed during detailed project preparation without materially altering the approved investment envelope.

Sector	Priority Action	Estimated Cost (GHS)
Agriculture	Climate-Smart Agriculture Training and Extension	2,621,000
	Small-Scale Irrigation Development and Water Management	2,170,000
	Agro-processing and Agricultural Value Chain Support	468,000
Agriculture Sector Total		5,259,000
Infrastructure	Flood Embankments and Flood Protection Infrastructure	14,200,000
	Drainage Rehabilitation and Improvement	5,400,000
	Climate-Proof Roads and Market Access Infrastructure	2,400,000
Infrastructure Sector Total		22,000,000
Health	Hygiene and Environmental Health Promotion Campaigns	266,000
	Community-Based Malaria and Disease Control Programme	360,000
	Climate-Sensitive Disease Surveillance and Community Health Outreach	1,430,000
Health Sector Total		2,056,000
Water Resources	Construction and Rehabilitation of Boreholes	463,000
	Rainwater Harvesting Systems	620,000
	Community Water Resource Protection and Management	1,370,000
Water Resources Sector Total		2,453,000
Gender and Social Inclusion	Support for Women-Led Cooperatives and Climate-Resilient Enterprises	1,187,000
	Green Skills and Climate Livelihood Training	754,000
	Alternative Livelihood Development (Briquettes and Climate Enterprises)	296,000
Gender and Social Inclusion Sector Total		2,237,000
Total CAP Investment Portfolio	15 Priority Actions	34,005,000

Note: Costs are indicative planning estimates that may be refined during detailed project design, procurement and implementation. Totals include capital investments, training, operational support, monitoring and evaluation, and other implementation-related expenditures required to deliver each priority adaptation action.

Table D2. Sector Investment Distribution

Sector	Number of Actions	Cost (GHS)	Share of Total Portfolio (%)
Agriculture	3	5,259,000	15.5
Infrastructure	3	22,000,000	64.7
Health	3	2,056,000	6.0
Water Resources	3	2,453,000	7.2
Gender and Social Inclusion	3	2,237,000	6.6
Total	15	34,005,000	100.0

Costing Assumptions: Cost estimates were developed using activity-based costing principles and informed by recent district projects, sector agency experience, prevailing market rates and stakeholder consultations. Costs are expressed in Ghana Cedis (GHS) and represent indicative planning estimates for phased implementation over the CAP implementation period. Inflation adjustments were not applied. Detailed activity-level costing sheets are maintained separately by the Kumbungu District Assembly and formed the basis of the estimates presented in this annex.

Annex E – Implementation, Monitoring and Evaluation Framework

E1. Introduction

This appendix presents an indicative framework for implementing, monitoring, evaluating and reporting on the Climate Adaptation Plan. It complements the implementation arrangements presented in Chapter 6 by providing practical guidance on implementation sequencing, monitoring indicators, institutional responsibilities and reporting arrangements. The framework is intended to support coordinated implementation, strengthen accountability, facilitate evidence-based decision-making and promote adaptive management throughout the implementation period.

E2. Indicative Implementation Schedule

Implementation of the CAP is expected to follow a phased approach based on project readiness, financing availability and institutional capacity. Lower-cost and capacity-building interventions are expected to commence earlier, while large infrastructure investments will require additional technical preparation, resource mobilisation and procurement before implementation.

Table D1. Phased Implementation Schedule for Priority Adaptation Actions

Sector	Adaptation Action	Lead Institution	Year 1	Year 2	Year 3
Agriculture	Climate-Smart Agriculture Training and Extension	Department of Agriculture	✓	✓	✓
	Agro-processing and Agricultural Value Chain Support	Department of Agriculture / BAC	✓	✓	
	Small-Scale Irrigation Development and Water Management	Department of Agriculture / GIDA		✓	✓
Infrastructure	Flood Embankments and Flood Protection Infrastructure	Works Department		✓	✓
	Climate-Proof Roads and Market Access Infrastructure	Works Department		✓	✓
	Drainage Rehabilitation and Improvement	Works Department	✓	✓	
Health	Climate-Sensitive Disease Surveillance and Community Health Outreach	District Health Directorate	✓	✓	✓
	Hygiene and Environmental Health Promotion Campaigns	Environmental Health Unit	✓	✓	✓
	Community-Based Malaria and Disease Control Programme	District Health Directorate	✓	✓	✓
Water Resources	Construction and Rehabilitation of Boreholes	District Assembly / CWSA	✓	✓	
	Rainwater Harvesting Systems	Works Department	✓	✓	✓
	Community Water Resource Protection and Management	District Assembly / WRC	✓	✓	✓
Gender and Social Inclusion	Support for Women-Led Cooperatives and Climate-Resilient Enterprises	Gender Desk	✓	✓	✓
	Green Skills and Climate Livelihood Training	Community Development Unit	✓	✓	✓
	Alternative Livelihood Development (Briquettes and Climate Enterprises)	Community Development Unit		✓	✓

E3. Monitoring Indicator Matrix

The existing matrix is appropriate and may be retained. However, where feasible, the District Assembly may incorporate implementation targets (e.g., 10 demonstration farms, approximately 1,000 farmers trained, five boreholes constructed, five boreholes rehabilitated, 20 rainwater harvesting systems installed, 20 VSLAs strengthened, and 10 women-led cooperatives supported) into annual monitoring plans to facilitate performance assessment against the planned implementation scope.

Table D2. Core Monitoring Indicators

Priority Action	Key Monitoring Indicators	Means of Verification	Reporting Frequency
Climate-Smart Agriculture Training and Extension	Approximately 1,000 farmers trained; 10 demonstration farms established; 45,000 tree seedlings distributed; percentage of farmers adopting CSA practices	Department of Agriculture reports, field monitoring reports	Quarterly
Small-Scale Irrigation Development and Water Management	Five irrigation schemes developed; hectares under irrigation; number of farmers benefiting; reduction in dry-season production constraints	GIDA reports, field inspections	Quarterly
Agro-processing and Agricultural Value Chain Support	Twenty VSLAs established or strengthened; enterprises supported; increase in household income; reduction in post-harvest losses	BAC reports, cooperative records	Quarterly
Flood Embankments and Flood Protection Infrastructure	Kilometres of embankments completed; number of communities protected; reduction in flood damage	Engineering reports, field inspections	Biannual
Drainage Rehabilitation and Improvement	Kilometres of drains rehabilitated; six priority settlements benefiting; reduction in flood incidence	Works Department reports	Quarterly
Climate-Proof Roads and Market Access Infrastructure	Five feeder roads improved; ten culverts constructed or rehabilitated; improved year-round accessibility	Works Department reports	Biannual
Hygiene and Environmental Health Promotion Campaigns	Number of communities reached; hygiene campaigns conducted; improved household hygiene practices; reduction in waterborne diseases	Environmental Health reports	Quarterly
Community-Based Malaria and Disease Control Programme	Number of mosquito nets distributed; malaria prevention campaigns conducted; reduction in malaria incidence	District Health Directorate reports	Quarterly
Climate-Sensitive Disease Surveillance and Community Health Outreach	Number of communities covered; outreach activities conducted; timeliness of disease reporting; response time to outbreaks	Disease surveillance reports	Quarterly
Construction and Rehabilitation of Boreholes	Five new boreholes constructed; five boreholes rehabilitated; households with improved access to safe water; WATSAN Committees operational	CWSA reports, field inspections	Quarterly

Priority Action	Key Monitoring Indicators	Means of Verification	Reporting Frequency
Rainwater Harvesting Systems	Twenty complete rainwater harvesting systems installed; beneficiary institutions served; percentage of systems operational after one year	Works Department reports	Quarterly
Community Water Resource Protection and Management	Twelve WATSAN Committees established or strengthened; water sources protected; water quality monitoring undertaken	WRC and District reports	Biannual
Support for Women-Led Cooperatives and Climate-Resilient Enterprises	Ten cooperatives supported; women trained; enterprise productivity and income improvements	Gender Desk and BAC reports	Quarterly
Green Skills and Climate Livelihood Training	Ten training programmes delivered; approximately 300 beneficiaries trained; five demonstration farms established; green enterprises created	Community Development Unit reports	Quarterly
Alternative Livelihood Development (Briquettes and Climate Enterprises)	Five community briquette enterprises established; beneficiaries trained; production levels achieved; reduced dependence on fuelwood	Community Development Unit reports	Quarterly

E4. Evaluation Framework

Periodic evaluations should assess the effectiveness, efficiency, relevance, sustainability and potential impact of CAP implementation. Evaluation findings should inform future planning, budgeting and adaptive management decisions.

Table D3. Proposed Evaluation Framework

Evaluation Type	Indicative Timing	Purpose
Baseline Review	Prior to implementation	Confirm baseline conditions and implementation readiness
Mid-Term Evaluation	Midway through implementation	Assess implementation progress, identify bottlenecks and recommend corrective actions
Final Evaluation	At completion of the implementation period	Assess achievement of outcomes, effectiveness, sustainability and lessons learned

E5. Reporting Framework

Table D4. Recommended Reporting Arrangements

Report	Frequency	Lead Institution	Primary Audience
Implementation Progress Report	Quarterly	Lead Implementing Departments	DPCU and District Management
Financial Progress Report	Quarterly	Finance Department	DPCU and District Management

Report	Frequency	Lead Institution	Primary Audience
CAP Progress Review	Biannual	DPCU	District Assembly and Sector Departments
Annual Adaptation Performance Review	Annual	DPCU and Sector Departments	District Assembly and Stakeholders
CAP Integration into Annual Action Plans and Composite Budgets	Annual	Planning Unit and Finance Department	District Assembly
CAP Integration into MTDP Reviews	In line with MTDP review cycle	DPCU	District Assembly and Stakeholders

E6. Institutional Roles and Responsibilities

Table D5. Roles and Responsibilities Matrix

Institution	Planning	Implementation	Monitoring	Reporting
DPCU	Lead	Support	Lead	Lead
Finance Department	Support	Support	Support	Lead
Department of Agriculture	Support	Lead	Lead	Support
Works Department	Support	Lead	Lead	Support
Environmental Health Unit	Support	Lead	Lead	Support
District Health Directorate	Support	Lead	Lead	Support
Gender Desk	Support	Support	Lead	Support
Community Development Unit	Support	Lead	Support	Support
CWSA/WATSAN Structures	Support	Lead	Support	Support

Implementation of the CAP will be supported by relevant sector agencies and collaborating institutions according to their respective mandates. These include the Ghana Irrigation Development Authority (GIDA), Business Advisory Centre (BAC), Community Water and Sanitation Agency (CWSA), Water Resources Commission (WRC), Ghana Health Service (GHS), Environmental Protection Authority (EPA), development partners, non-governmental organisations, community-based organisations and traditional authorities. Their technical support will complement the coordination role of the District Assembly and the District Planning Coordinating Unit (DPCU).

E7. Capacity Development Priorities

Successful implementation of the CAP will require sustained strengthening of institutional and technical capacities across district departments. Priority capacity development areas include:

- Climate adaptation planning and mainstreaming;
- Resource mobilisation and adaptation finance;
- Activity-based costing and financial management;
- Monitoring, evaluation and learning;
- Gender-responsive and socially inclusive implementation;
- Climate-resilient infrastructure management;
- Cross-sector coordination and stakeholder engagement.

Capacity development should combine formal training, peer learning, technical mentoring and on-the-job support to strengthen long-term institutional capability.

E8. Learning and Adaptive Management

Implementation should be accompanied by structured learning and periodic reflection to ensure that experience informs future planning and investment decisions. Monitoring and evaluation findings should be used to:

- Improve implementation effectiveness;
- Revise annual work plans where necessary;
- Strengthen resource allocation decisions;
- Scale up successful interventions;
- Address implementation challenges;
- Improve future adaptation planning and budgeting.

Embedding continuous learning and adaptive management within existing district planning systems will help ensure that the Climate Adaptation Plan remains responsive to changing climate risks, development priorities and financing opportunities while strengthening the district's long-term resilience.