

IMPACT-Ghana: Integrated Mangrove restoration and People-centered Action for Coastal Thriving resilience in Ghana’s Eastern and Western Coastal Zones

RATIONALE

Geographical and Climatic Profile

Ghana is located along the Gulf of Guinea in West Africa, between latitudes 4° and 11° North and longitudes 3° and 1°30' West, covering approximately 238,533 square kilometers. The country’s diverse landscape includes approximately 540 kilometers of coastline characterized by low-lying beaches, mangroves, estuaries, wetlands, rocky shores, and diverse marine ecosystems. More than 25% of Ghana’s population resides within these coastal zones, which are increasingly vulnerable to climate-induced hazards such as sea-level rise, coastal erosion, flooding, intensified storm events, and saltwater intrusion (Ghana Statistical Service, 2021).

Historical climate records indicate a sea-level rise along Ghana’s coast of approximately 2–3 mm per year. Sea-level rise projections for Ghana’s coast now range from 0.5–1.2m by 2100 under SSP2-4.5 (IPCC 2023), threatening \$300M in coastal infrastructure. The eastern coastline (notably Ada, Keta, Anloga) and western coastline (particularly communities like Axim, Shama, Sekondi-Takoradi, Elmina, and Cape Coast) are already experiencing frequent flooding, severe coastal erosion, and significant property losses annually (World Bank, 2019). Additionally, climate projections for these regions indicate temperature increases of approximately 2°C by mid-century (2050), intensifying rainfall variability, extreme weather events, and shifts in climatic patterns critical to ecosystems and livelihoods.

Table 1: Overall trends in climate for the remainder of the century in °C/decade and %/decade

	Temperature °C/decade			Rainfall %/decade		
	RCP2.6	RCP4.5	RCP8.5	RCP2.6	RCP4.5	RCP8.5
North	+0.09	+0.24	+0.57	-0.1	+0.1	+0.6
Central	+0.08	+0.23	+0.55	-0.0	+0.0	+0.6
Southwest	+0.08	+0.23	+0.52	+0.1	+0.1	+0.6
Coastal	+0.08	+0.22	+0.50	-0.1	+0.3	+0.8

Source: EPA, 2023, Downscaled Temperature and Precipitation Scenarios Report

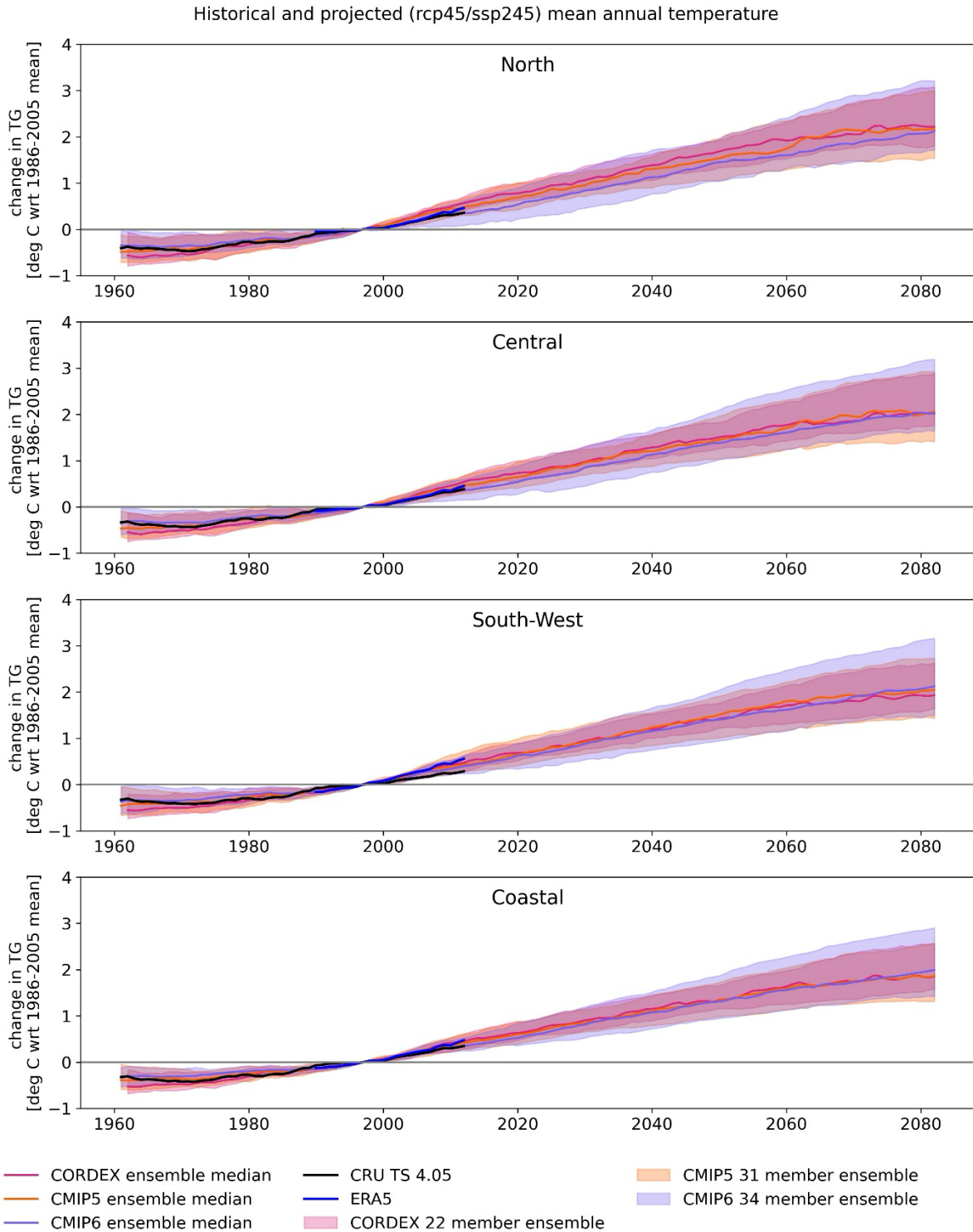


Figure 1. Projected change in mean annual temperature for all climate zones – RCP4.5 – SSP 2
Source: EPA, 2023, *Downscaled Temperature and Precipitation Scenarios Report*

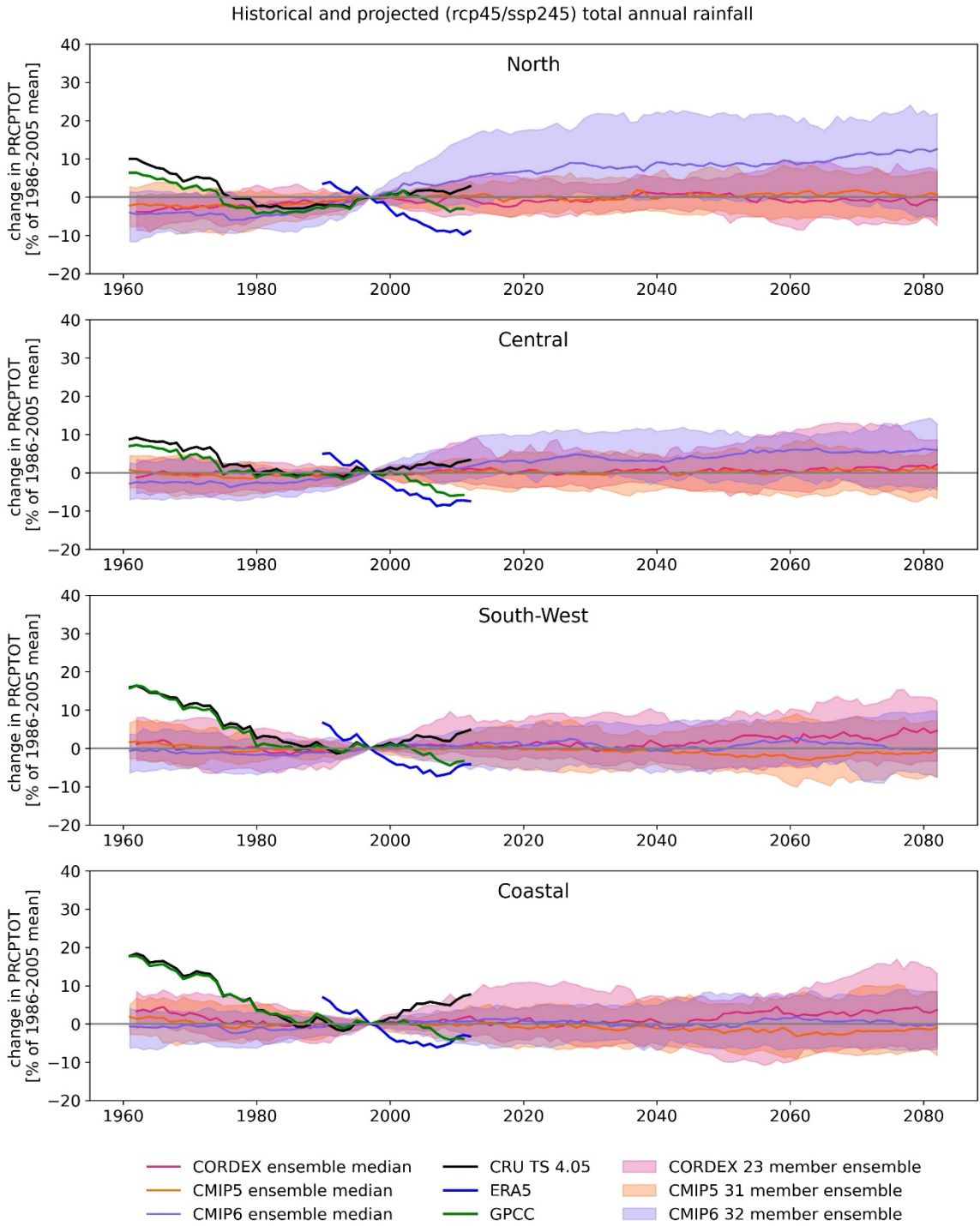


Figure 2. Projected change in total annual precipitation for all climate zones – RCP4.5 - SSP 2
Source: EPA, 2023, Downscaled Temperature and Precipitation Scenarios Report

Socioeconomic and Livelihood Profile of the Western and Eastern Coastal Region

The targeted communities along Ghana’s eastern (Ada, Keta, Anloga) and western coastline (Axim, Shama, Sekondi-Takoradi, Elmina, Cape Coast) are economically diverse yet heavily dependent on ecosystem-based livelihoods. These communities collectively support an estimated population exceeding 2.7 million people directly reliant on coastal and marine resources. Artisanal fisheries form a central livelihood activity, especially in Axim, Sekondi-Takoradi, Elmina, Ada, and Keta, providing primary food security, employment, and income for local populations (FAO, 2024; Ghana Statistical Service, 2022).

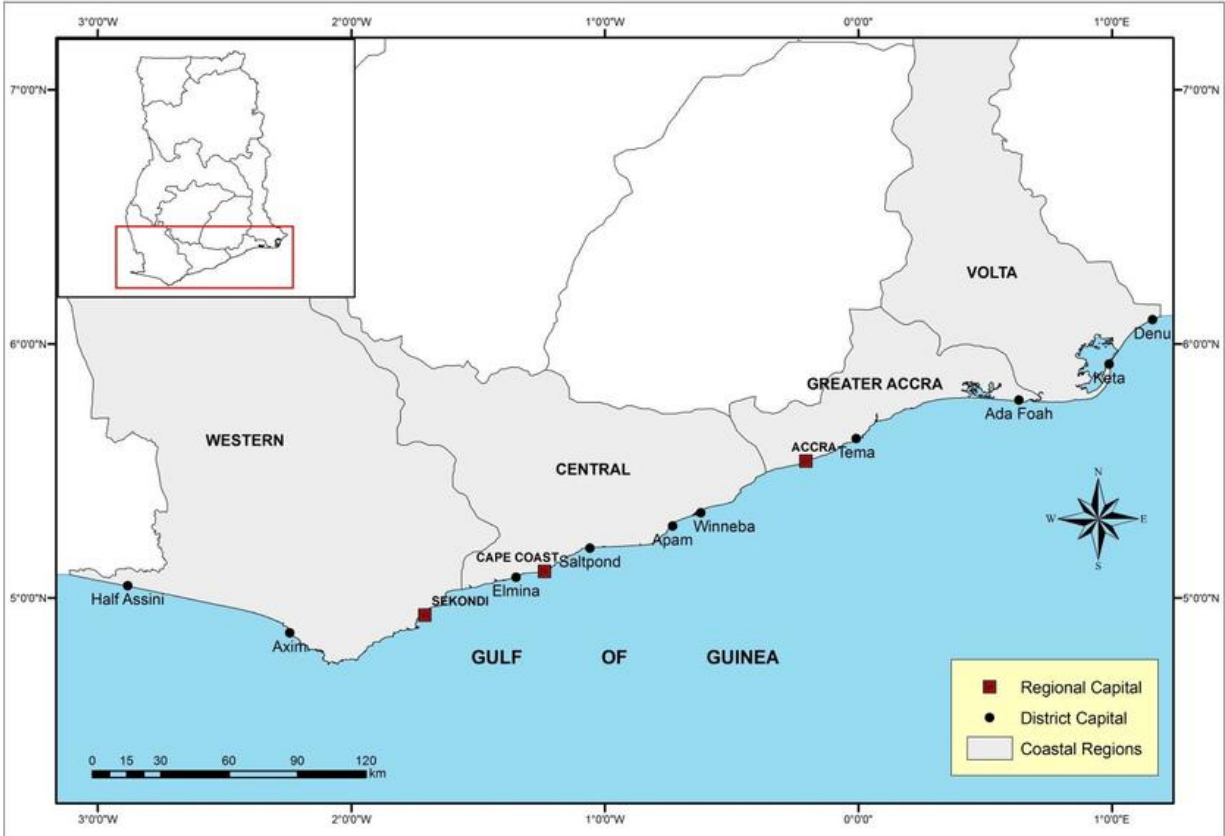


Figure 3. Map showing Ghana’s coastline
Source: Aseidu, 2017

Tourism is another vital economic sector, especially along the western coastline, attracting over 150,000 visitors annually drawn to the historical sites, beaches, and eco-tourism destinations in Cape Coast, Elmina, and surrounding towns. Agriculture primarily subsistence and small-scale commercial farming is critical, particularly in eastern coastline communities around the Volta Delta, where land and freshwater resources are increasingly impacted by saline intrusion.

Impact of Climate Risks on Livelihoods and Socioeconomic Aspects

The livelihoods and economic stability of communities along Ghana’s eastern and western coastlines face significant threats from climate change impacts. The fisheries sector has suffered declining catches linked to deteriorating marine habitats and shifting fish distributions, influenced

directly by rising ocean temperatures, degraded ecosystems, and compounded by unsustainable fishing practices. Overfishing, driven partially by degraded ecosystems, further reduces the resilience of fish stocks, leading to economic instability and reduced food security for coastal communities. Fisherfolk in Ada, Keta, and Axim report decreased incomes and growing economic vulnerability due to these climate-driven changes (Belhabib et al., 2016; Trisos et al., 2020)

Coastal erosion and flooding have severely impacted agriculture and tourism infrastructure. Frequent flooding and salinity intrusion in eastern communities (Ada, Keta, Anloga) have significantly reduced agricultural productivity, undermining local food systems and economic resilience. Similarly, tourism infrastructure in western coastline towns such as Cape Coast, Elmina, and Axim is increasingly damaged or threatened by coastal erosion and storm surges, causing substantial economic losses annually. Estimates indicate annual economic damages from climate impacts on coastal infrastructure and livelihoods run into millions of dollars (World Bank, 2019).

Ecological Importance and Vulnerability of Targeted Coastal Ecosystems

The targeted eastern and western coastal communities contain ecologically significant ecosystems, including mangroves, estuaries, wetlands, seagrasses, and rocky shores. These ecosystems provide essential ecosystem services such as shoreline stabilization, flood regulation, fisheries productivity, carbon sequestration, and biodiversity conservation (Ghermandi et al., 2019). However, these critical ecosystems are rapidly degrading under pressures from climate-induced changes, compounded by anthropogenic activities such as urbanization, deforestation, sand mining, and canalization (Numbere, 2019).

Mangroves, central to climate resilience, coastal protection, and fisheries productivity, have declined by over 50% in parts of the eastern (Volta Delta) and western coastline (Axim, Shama, Sekondi-Takoradi), significantly affecting local ecological stability. Critically, degraded mangroves lose approximately 40% of their carbon sequestration capacity (Murphy et al., 2023), thereby exacerbating greenhouse gas emissions, climate vulnerability, and diminishing communities' ability to adapt to climate impacts.

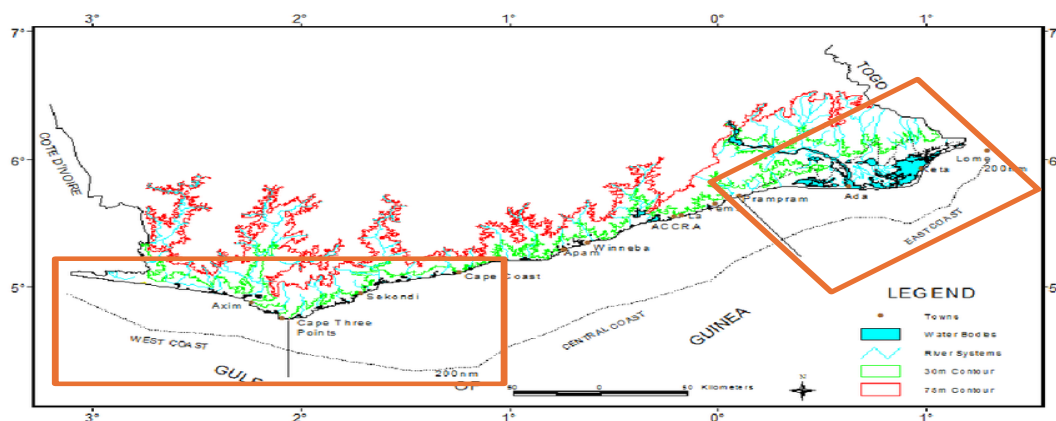


Figure 4. Map showing project sites and climate vulnerability hotspots

Source: Boateng, 2009

Barriers and Risks Justifying the Project

Several critical barriers currently limit effective adaptation in Ghana's coastal areas, particularly the Western coastline. These include:

- Insufficient funding for ecosystem-based adaptation initiatives.
- Fragmented institutional coordination across local and national governance structures.
- Limited technical and human capacity within local authorities and communities for managing and implementing adaptation actions.
- Inadequate community awareness and participation in climate change adaptation planning and ecosystem management.
- Poor integration of climate risk considerations into local development and spatial planning processes.
- Insufficient enforcement and implementation of existing climate and environmental policies.

Addressing these barriers justifies the project's specific objectives and activities, emphasizing integrated ecosystem restoration and community-based resilience-building.

Alignment with Existing Policy Frameworks

The proposed project aligns with Ghana's key national climate adaptation and environmental policies, including the National Climate Change Policy, Ghana's updated Nationally Determined Contributions (NDCs, 2021), National Adaptation Planning Framework (NAPF, 2018), National Biodiversity Strategy and Action Plan, and Coastal Zone Management Plans. At the subnational level, it aligns with the various districts Medium Term Development Plans (MTDPs) in the targeted communities (Eastern - Ada, Keta, Anloga and Western - Axim, Sekondi-Takoradi, Elmina, Cape Coast) explicitly supporting sustainable resource management and climate-resilient development. Internationally, the project supports Ghana's commitments under global agreements such as the Paris Agreement (UNFCCC), the Convention on Biological Diversity (CBD), and the Ramsar Convention, underscoring its alignment with global climate adaptation, biodiversity, and sustainability goals

Existing Initiatives and Complementarity

Multiple adaptation-focused initiatives have previously operated or are ongoing in Ghana's coastal regions. Notable projects include the World Bank-funded West Africa Coastal Areas Management Program (WACA), Adaptation Fund initiatives targeting livelihood diversification, and UNDP-supported ecosystem-based adaptation (EbA) efforts.

However, there are no existing GCF-funded projects specifically addressing integrated mangrove restoration combined with comprehensive community-based resilience-building in selected eastern and western coastal communities. This project uniquely builds upon lessons from previous initiatives, filling crucial gaps by ensuring enhanced community engagement, ecosystem restoration, and policy integration, providing sustainable, scalable adaptation solutions to Ghana's critical coastal vulnerability.

Ghana's mitigation and adaptation needs, and the emission profile

Ghana's Climate Vulnerability and Adaptation Needs

Ghana ranks among the most climate-vulnerable countries in Africa, frequently affected by floods, droughts, extreme temperatures, and sea-level rise, significantly impacting agriculture, water resources, health, infrastructure, and biodiversity. According to the ND-GAIN Index (2022), Ghana currently ranks 112 out of 182 countries globally, underscoring its considerable vulnerability to climate impacts and limited adaptive capacity.

Coastal communities, especially those in eastern (Ada, Keta, Anloga) and western (Axim, Shama, Sekondi-Takoradi, Elmina, Cape Coast) regions, are acutely vulnerable, facing increased risks of flooding, storm surges, erosion, and livelihood insecurity due to rising sea levels and intensified storms. Critical infrastructure, agriculture, fisheries, tourism, and biodiversity are significantly exposed, resulting in substantial economic damages annually, affecting livelihoods and exacerbating poverty levels.

Ghana's National Adaptation Plan Framework (NAPF, 2018) identifies coastal ecosystem restoration and management, climate-resilient agriculture, disaster risk reduction, water resource management, and capacity-building as key adaptation priorities. However, existing adaptive capacities remain constrained by insufficient funding, limited technical expertise, inadequate infrastructure, and weak institutional and community-level capacities.

The targeted coastal communities require integrated adaptation interventions explicitly focused on ecosystem-based approaches, sustainable livelihoods, strengthened community resilience, improved governance frameworks, and targeted capacity-building initiatives.

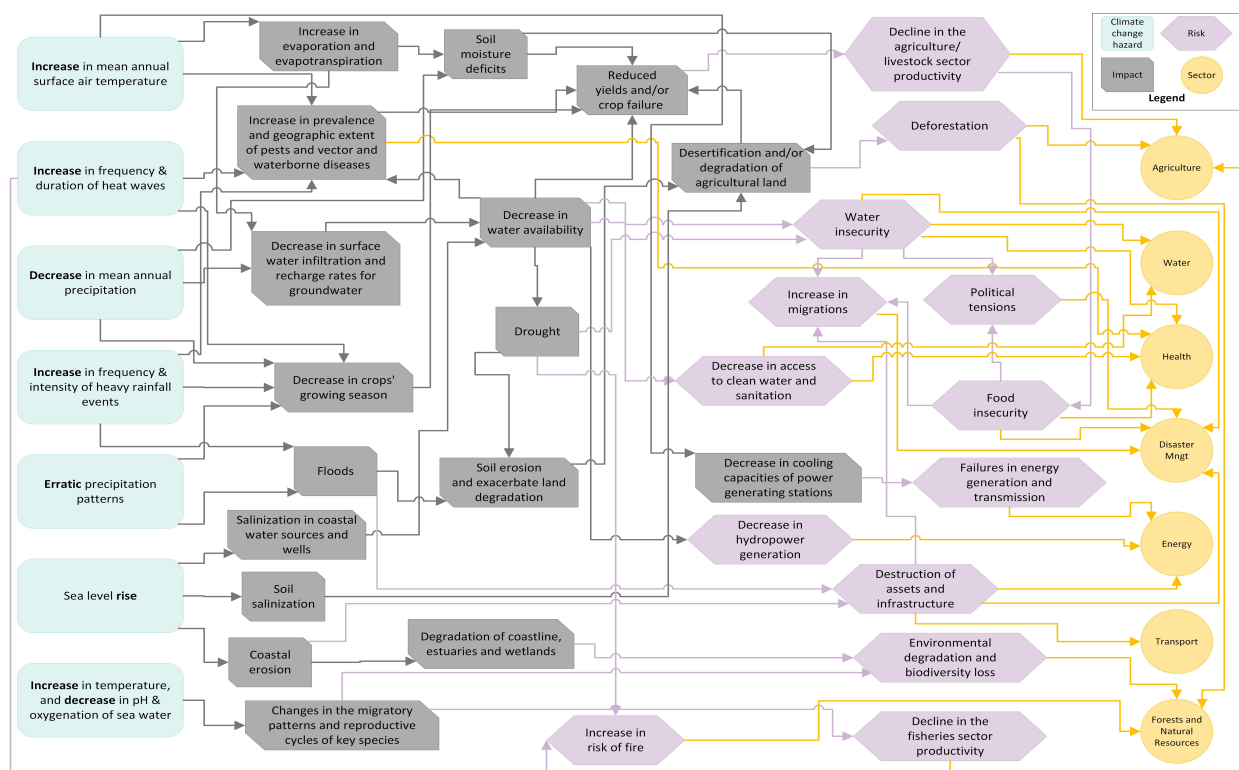


Figure 5. Impact chain diagram for selected climate hazards and risk domains relevant for use at the MMDA level in Ghana

Source: EPA, 2023, *Downscaled Temperature and Precipitation Scenarios Report*

Ghana's Emission Profile and Mitigation Needs

Ghana's total greenhouse gas (GHG) emissions were approximately 59 million tons of CO₂ equivalent in 2021, accounting for approximately 0.06% of global emissions. Despite contributing relatively little to global emissions, Ghana's emissions trajectory is rapidly increasing, driven primarily by the energy, agriculture, forestry and other land use (AFOLU), waste, and transport sectors (Ghana's Fifth National Greenhouse Gas Inventory Report, EPA, 2022).

The energy sector remains Ghana's largest source of emissions (36%), driven by increased fossil-fuel-based electricity generation, industrial expansion, and growing transportation demands. Agriculture, forestry, and land use (AFOLU) constitute around 32% of Ghana's emissions, mainly due to deforestation, land degradation, and unsustainable agricultural practices. The waste sector contributes significantly (18%), followed by transport emissions (approximately 14%).

Ghana's Nationally Determined Contributions (NDCs, updated 2021) outline an ambitious mitigation target of an unconditional 15% and a conditional 45% reduction of GHG emissions by 2030 compared to a business-as-usual scenario. Achieving this target requires significant investment in renewable energy, sustainable land-use management, waste management

improvements, energy efficiency measures, and ecosystem restoration efforts, especially in carbon-rich habitats like mangroves and forests.

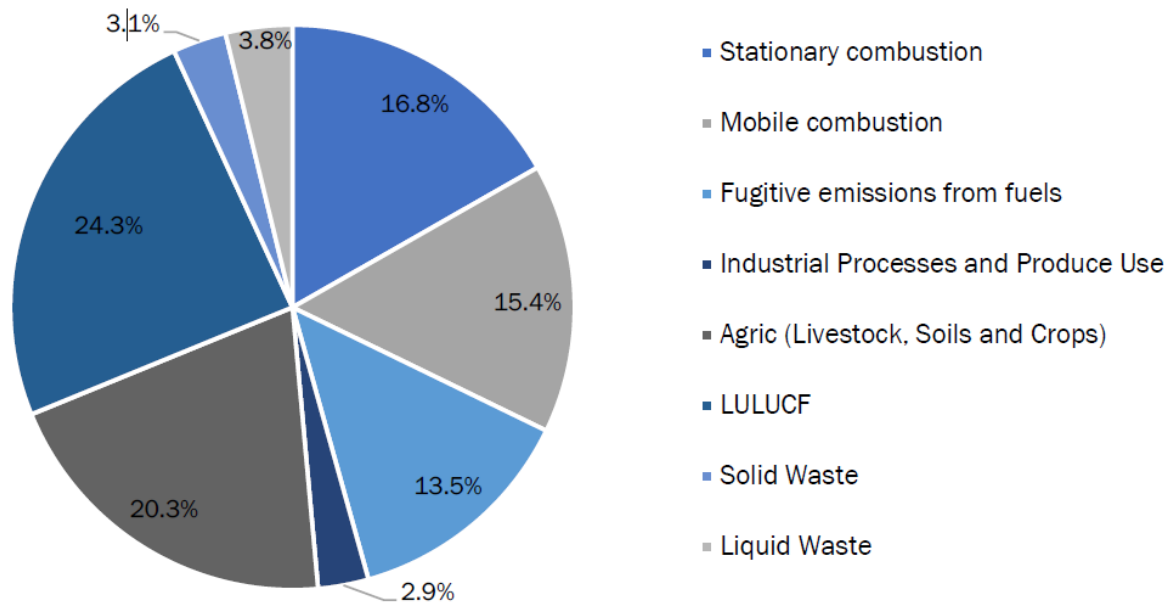


Figure 6. Total emissions by source/removals by categories in 2019

Source: Ghana's Fifth National Greenhouse Gas Inventory Report, EPA, 2022

Role of Ecosystem-based Adaptation and Mitigation Potential

It is widely acknowledged that Ecosystem-based Adaptation measures, such as mangrove restoration, wetland conservation, coastal afforestation, and sustainable management practices, provide dual adaptation and mitigation benefits. Mangroves in particular have among the highest carbon sequestration capacities globally, sequestering carbon at rates up to five times greater than terrestrial forests. However, degraded mangroves lose up to 40% of their carbon sequestration capacity, significantly increasing emissions and community vulnerability (Murphy et al., 2023).

The restoration and sustainable management of mangrove ecosystems along Ghana's eastern and western coastlines thus represent a strategic, cost-effective approach to achieving both adaptation and mitigation objectives. In addition to carbon storage, restored mangrove ecosystems stabilize shorelines, reduce coastal erosion and flooding, enhance fisheries productivity, and provide long-term economic and livelihood benefits, directly aligning with national mitigation targets and adaptation priorities.

Gaps and Opportunities for Integrated Action

Currently, Ghana faces considerable barriers to achieving its adaptation and mitigation targets, including limited financing, inadequate institutional coordination, and low technical and community capacities. There remains a significant implementation gap between national policy priorities (NDCs, NAP) and practical actions at community levels, especially regarding integrated ecosystem-based adaptation and mitigation initiatives.

The proposed project directly responds to these identified gaps and opportunities by implementing integrated nature-based solutions (NbS) in targeted coastal communities. These interventions will deliver substantial benefits, including increased resilience to climate impacts, enhanced ecosystem services, improved carbon sequestration, and sustained socioeconomic development, while substantially contributing to Ghana’s climate commitments under the Paris Agreement and Sustainable Development Goals (SDGs).

Main Project Objective

To enhance climate resilience and adaptive capacity in Ghana’s eastern and western coastal zones through integrated mangrove restoration and community-led, nature-based solutions that protect livelihoods, ecosystems, and infrastructure.

Specific Objectives

1. Strengthen community engagements, governance and capacity for coastal ecosystems management.
2. To restore and sustainably manage 500 hectares of mangroves and 200 hectares of coastal wetlands by 2030
3. Enhance Adaptive capacity and economic resilience of coastal communities through sustainable livelihoods.

Short-Term Outcomes	<ol style="list-style-type: none"> 1. Improved environmental conditions through restoration of degraded mangroves and wetlands. 2. Increased household income and economic stability through climate-resilient and nature-based livelihoods. 3. Strengthened enforcement and alignment of local climate policies with national strategies. 4. Enhanced awareness and uptake of climate-smart and ecosystem-based practices. 5. 30% increase in women’s participation in mangrove governance committees and climate decision-making processes.
Medium-Term Outcomes	<ol style="list-style-type: none"> 1. Restored and sustainably managed coastal ecosystems delivering resilient ecosystem services. 2. Expansion of green jobs and livelihood opportunities, especially for women and youth. 3. Strengthened local governance of coastal and marine resources through inclusive and participatory structures. 4. Increased adoption of integrated adaptation and mitigation strategies at the community level.
Long-Term Impact	Climate-resilient and gender-responsive coastal communities sustained by restored ecosystems, contributing to Ghana’s NDCs, NAPs, SDGs, the UN

	Convention on Biological Diversity (UNCBD), and national low-emission development pathways.
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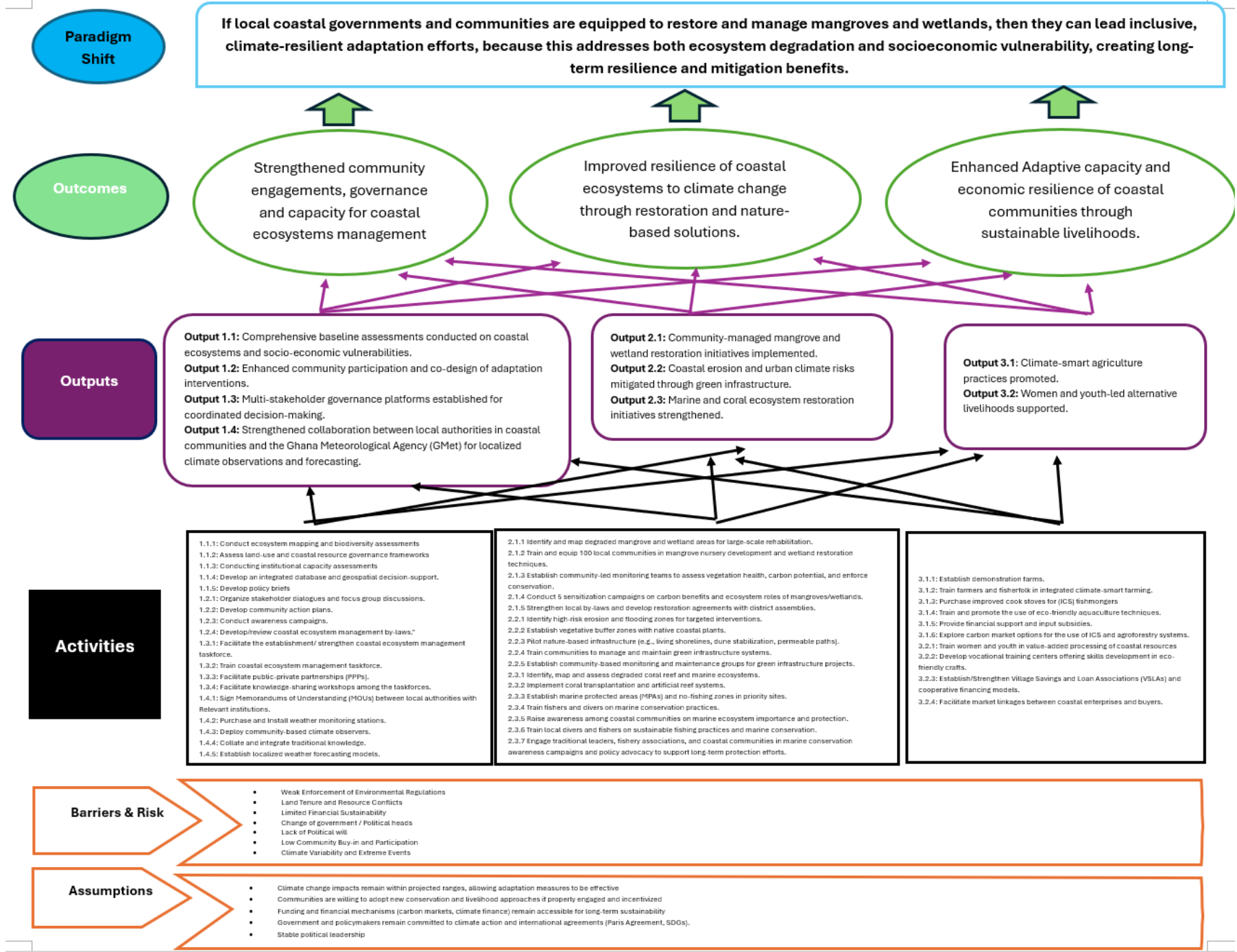
Outcome, Outputs and Activities

Outcome	Output
Outcome 1: Strengthened community engagement and governance for sustainable coastal ecosystem management.	Output 1.1: Baseline assessments conducted on coastal ecosystems and socio-economic vulnerabilities.
	Output 1.2: Enhanced community participation and co-design of adaptation interventions.
	Output 1.3: Multi-stakeholder governance platforms established for coordinated decision-making.
	Output 1.4: Strengthened collaboration between local authorities in coastal communities and the Ghana Meteorological Agency (GMet) for localized climate observations and forecasting.
Outcome 2: Improved resilience of coastal ecosystems to climate change through restoration and nature-based solutions.	Output 2.1: Community-led & managed mangrove and wetland restoration initiatives implemented.
	Output 2.2: Coastal erosion and urban climate risks mitigated through green infrastructure.
	Output 2.3: Marine and coral ecosystem restoration initiatives strengthened.
Outcome 3: Enhanced adaptive capacity and economic resilience of coastal communities through sustainable livelihoods.	Output 3.1: Climate-smart agriculture practices promoted.
	Output 3.2: Women and youth-led alternative livelihoods supported.

Paradigm Shift

If local coastal governments and communities are equipped to restore and manage mangroves and wetlands, then they can lead inclusive, climate-resilient adaptation efforts, because this addresses both ecosystem degradation and socioeconomic vulnerability, creating long-term resilience and mitigation benefits.

Theory of Change



Risk assumptions and mitigation measures

Risk Category	Risk Assumption	Risk Level (High, Medium, Low)	Mitigation Measures
Environmental Risks	Extreme weather events (floods, storm surges, droughts) affecting project sites	High	Integrate climate-resilient designs, establish early warning systems, and train communities in disaster preparedness
	Coastal erosion reducing the effectiveness of restoration efforts	High	Use nature-based solutions like mangrove and dune restoration, and implement erosion control structures
	Pollution from industrial and human activities affecting marine and coastal biodiversity	Medium	Strengthen enforcement of environmental laws, promote community-led monitoring, and engage local industries in sustainable practices
	Salinization of soil reducing the effectiveness of climate-smart agriculture	Medium	Promote salt-tolerant crops, improve irrigation management, and implement soil conservation practices
Social Risks	Low community participation due to lack of awareness or competing livelihood needs	Medium	Conduct community sensitization campaigns, involve local leaders, and provide incentives for participation
	Resistance to policy changes from local institutions and government agencies	Medium	Conduct stakeholder engagements, provide policy briefs, and demonstrate socio-economic benefits of proposed policies
	Conflicts over land use and resource allocation in restoration and conservation zones	High	Engage traditional leaders, conduct participatory land-use planning, and ensure transparent decision-making

	Gender and youth inclusion challenges in livelihood programs	Medium	Design targeted capacity-building programs, establish women/youth-led cooperatives, and provide equal access to resources
Economic and Financial Risks	Currency Fluctuations	High	Develop public-private partnerships (PPPs), explore carbon financing, and secure long-term donor funding
	Limited funding for project implementation and sustainability	High	Develop public-private partnerships (PPPs), explore carbon financing, and secure long-term donor funding
	Market access challenges for eco-based enterprises and sustainable tourism	Medium	Establish market linkages, provide business training, and facilitate access to microfinance
	High cost of adopting climate-smart technologies (e.g., improved cookstoves, aquaculture systems)	Medium	Provide financial support, subsidies, and technical assistance for local entrepreneurs
Technological Risks	Limited access to digital tools and early warning systems in rural coastal communities	Medium	Develop mobile-friendly, low-cost technologies and conduct training sessions on their use
	Inadequate technical capacity for GIS mapping, drone surveillance, and climate data analysis	Medium	Train local experts, collaborate with academic institutions, and provide continuous capacity building
Regulatory and Policy Risks	Delays in policy adoption or enforcement affecting project implementation	High	Strengthen institutional engagement, advocate for policy integration, and support local regulatory frameworks
	Weak enforcement of marine protected areas (MPAs) and conservation laws	Medium	Enhance monitoring mechanisms, increase community-led enforcement, and provide training for regulatory agencies
Political Risks	Election cycles and Changes in government priorities affecting policy continuity and funding commitments	High	Pre-engage all major parties via MOUs. Engage policymakers from multiple political parties,

			align the project with national climate strategies, and secure multi-year funding agreements
	Political instability disrupting project activities and stakeholder engagements	Medium	Maintain flexibility in implementation plans, establish partnerships with local authorities, and develop contingency measures
	Bureaucratic delays in project approvals and permits	Medium	Strengthen government collaborations, engage key decision-makers early, and streamline documentation processes
	Influence of political interests on community decision-making, leading to conflicts	Medium	Ensure project neutrality, promote transparency in decision-making, and work with trusted community leaders across political divides

Project Summary

Outcomes	Outputs	Objectives	Activities	Deliverables	M&E indicators
<p>1. Strengthened community engagements, governance and capacity for coastal ecosystems management.</p>	<p>Output 1.1: Comprehensive baseline assessments conducted on coastal ecosystems and socio-economic vulnerabilities.</p>	<p>To develop a coastal ecosystem vulnerability mapping system that integrates mangrove health assessments, shoreline stability, and socio-economic dependencies to guide nature-based adaptation strategies.</p>	<p>1.1.1 Conduct ecosystem mapping and biodiversity assessments 1.1.2 Assess land-use and coastal resource governance frameworks by reviewing existing policies and by-laws 1.1.3 Conducting institutional capacity assessments 1.1.4 Develop an integrated database and geospatial decision-support system to store, analyze, and visualize assessment data for evidence-based planning and monitoring of climate adaptation interventions. 1.1.5 Develop policy briefs and recommendations to strengthen local regulatory frameworks for coastal protection.</p>	<p>Ecosystem mapping and biodiversity assessment reports. Land-use and governance framework review document. Institutional capacity assessment report. Integrated database and geospatial decision-support system. Policy briefs with recommendations.</p>	

	<p>Output 1.2: Enhanced community participation and co-design of adaptation interventions.</p>	<p>To establish community-led coastal buffer zones using native vegetation to reduce erosion and storm surge impacts while ensuring participatory decision-making in their design and management.</p>	<p>1.2.1 Organize 5 participatory stakeholder dialogues and 20 focus group discussions on climate resilience strategies. 1.2.2 Develop 5 community action plans for nature-based solutions (NbS) and integrate them into local development policies. 1.2.3 Conduct 5 awareness campaigns on the importance of coastal ecosystem conservation and restoration. 1.2.4 Develop/review 5 coastal ecosystem management by-laws.</p>	<p>Reports from stakeholder dialogues and 20 focus group discussions. Community action plans developed. Documentation of awareness campaigns. Coastal ecosystem by-laws developed/reviewed.</p>	<p>Number of community engagement events held. Number of community members engaged during focused group discussions. Number of community action plans developed and adopted. Number of coastal by-laws enacted or reviewed.</p>
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	<p>Output 1.3: Multi-stakeholder governance platforms established for coordinated decision-making.</p>	<p>To create an integrated coastal governance framework that facilitates collaborative mangrove and wetland conservation, linking community action with regional policy decisions.</p>	<p>1.3.1 Facilitate the establishment/ strengthen coastal ecosystem management taskforce from local government reps, traditional authorities, civil society, and private sector actors in 5 communities. 1.3.2 Train coastal ecosystem management taskforce on climate adaptation policies, sustainable coastal management, and enforcement of environmental regulations. 1.3.3 Facilitate public-private partnerships (PPPs) and resource mobilization efforts for 5 communities. 1.3.4 Facilitate 2 knowledge-sharing workshops among the taskforce to exchange best practices across coastal communities.</p>	<p>Reports from training sessions for taskforces. Documentation of public-private partnerships formed. Reports from knowledge-sharing workshops</p>	<p>Number of established coastal ecosystem management taskforces Number of governance platforms established. Number of stakeholders trained on climate adaptation policies. Amount of financial or technical resources mobilized through PPPs. Number of knowledge-sharing workshops conducted.</p>
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	<p>Output 1.4:Strengthened collaboration between local authorities in coastal communities and the Ghana Meteorological Agency (GMet) for localized climate observations and forecasting.</p>	<p>To implement a community-based climate monitoring program using locally trained volunteers to track changes in coastal ecosystems and enhance climate resilience planning.</p>	<p>1.4.1 Sign Memorandums of Understanding (MoUs) between local authorities with Gmet, NADMO, EPA, Relevant NGOs and CSOs to define roles and responsibilities. 1.4.2 Purchase and Install 3 weather monitoring stations in strategic coastal locations to collect real-time climate data. 1.4.3 Deploy community-based climate observers trained in basic meteorological data collection. 1.4.4 Collate and Integrate traditional knowledge from local communities with scientific climate observations. 1.4.5 Establish localized weather forecasting models adapted to coastal risks such as storm surges, tidal changes, and flooding. 1.4.6 Design an early warning system with community-specific alerts in local languages via SMS, radio, and community announcement systems. 1.4.7 Set up a digital dashboard to visualize real-time climate trends and predictions for use by local decision-makers.</p>	<p>Signed MoUs between GMet, local authorities, and partners. Installed weather monitoring stations. Trained community-based climate observers. Integrated traditional knowledge with scientific climate observations. Developed early warning system and community alert mechanisms. Digital dashboard for real-time climate visualization.</p>	<p>Number of MoUs signed. Number of weather monitoring stations installed. Number of trained community-based climate observers. Number of early warning alerts recipients Number of local decision-makers using the climate dashboard.</p>

2. Improved resilience of coastal ecosystems to climate change through large-scale restoration and nature-based solutions.	Output 2.1: Community-led & managed mangrove and wetland restoration initiatives implemented.	To restore and sustainably manage 500 ha of mangroves and 200 ha of coastal wetlands by 2030, enhancing ecosystem services and sequestering 13,000 tCO _{2e} annually.	2.1.1 Identify and map degraded mangrove and wetland areas for large-scale rehabilitation. 2.1.2 Train and equip 100 local communities in mangrove nursery development and wetland restoration techniques. 2.1.3 Establish community-led monitoring teams to assess vegetation health, carbon potential, and enforce conservation. 2.1.4 Conduct 5 sensitization campaigns on carbon benefits and ecosystem roles of mangroves/wetlands. 2.1.5 Strengthen local by-laws and develop restoration agreements with district assemblies.	Restoration maps for mangrove and wetland sites Community training and monitoring reports Local conservation agreements/by-laws	Hectares of mangroves and wetlands restored Annual tCO _{2e} sequestered Number of people trained (disaggregated by gender) Number of monitoring teams functional Compliance level with local by-laws
	Output 2.2: Coastal erosion and flooding risks reduced through integrated green infrastructure.	To stabilize eroding shorelines and reduce flood risks in high-risk coastal zones through hybrid green-gray infrastructure.	2.2.1 Identify high-risk erosion and flooding zones for targeted interventions. 2.2.2 Establish vegetative buffer zones with native coastal plants. 2.2.3 Pilot nature-based infrastructure (e.g., living shorelines, dune stabilization, permeable paths). 2.2.4 Train communities to manage and maintain green infrastructure systems. 2.2.5 Establish community-based monitoring and maintenance groups for green infrastructure projects.	Coastal risk assessment maps Images and reports of installed green infrastructure Training manuals and records	Kilometers of shoreline stabilized Reduction in flood incidence Number of maintenance teams formed Community satisfaction rate

	<p>Output 2.3: Marine and coral ecosystem restoration initiatives strengthened.</p>	<p>To enhance biodiversity and fisheries productivity by restoring coral and marine habitats and promoting sustainable marine resource governance.</p>	<p>2.3.1 Identify, map and assess degraded coral reef and marine ecosystems. 2.3.2 Implement coral transplantation and artificial reef systems. 2.3.3 Establish marine protected areas (MPAs) and no-fishing zones in priority sites. 2.3.4 Train fishers and divers on marine conservation practices. 2.3.5 Raise awareness among coastal communities on marine ecosystem importance and protection. 2.3.6 Train local divers and fishers on sustainable fishing practices and marine conservation. 2.3.7 Engage traditional leaders, fishery associations, and coastal communities in marine conservation awareness campaigns and policy advocacy to support long-term protection efforts.</p>	<p>Marine restoration reports Training reports for fishers and divers Community awareness campaign documentation</p>	<p>Area (ha) of marine ecosystems restored Number of MPAs established Percentage increase in marine biodiversity indicators Number of community members engaged in marine protection</p>

<p>3. Enhanced Adaptive capacity and economic resilience of coastal communities through sustainable livelihoods.</p>	<p>Output 3.1: Climate-smart agriculture practices promoted.</p>	<p>To introduce agroforestry buffer systems in coastal farmlands to enhance soil stability, improve water retention, and increase crop resilience to climate variability.</p>	<p>3.1.1 Establish 5 demonstration farms for salt-tolerant crops and agroforestry systems. 3.1.2 Train farmers and fisherfolk in integrated climate-smart farming and sustainable fisheries management. 3.1.3 Purchase 50 improved cook stoves for (ICS) fishmongers 3.1.4 Train and promote the use of eco-friendly aquaculture techniques to reduce pressure on wild fish stocks. 3.1.5 Partner with Private sector to provide financial support and input subsidies for adopting sustainable agriculture practices. 3.1.6 Explore carbon market options for the use of ICS and agroforestry systems</p>	<p>Carbon market feasibility study report. Project Design Document / Mitigation Activity Design Document</p>	<p>Number of demonstration farms established. Number of farmers and fisherfolk trained. Number of cookstoves distributed. Increase in alternative aquaculture production. Amount of financial support provided for sustainable agriculture. Carbon credits generated from climate-smart agriculture initiatives.</p>
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	<p>Output 3.2: Women and youth-led alternative livelihoods supported.</p>	<p>To develop sustainable blue economy enterprises, such as community-led oyster farming and seaweed cultivation, to provide climate-resilient livelihoods for women and youth.</p>	<p>3.2.1 Train women and youth in value-added processing of coastal resources (e.g., oyster farming, seaweed harvesting). 3.2.2 Develop vocational training centers offering skills development in eco-friendly crafts, sustainable textiles, briquettes and upcycled products, with a focus on utilizing locally available materials (e.g., coconut husks, bamboo, and recycled plastics) 3.2.3 Establish/Strengthen Village Savings and Loan Associations (VSLAs) and cooperative financing models to provide women and youth with accessible financial services for starting or expanding green businesses. 3.2.4 Facilitate market linkages between coastal enterprises and national/international buyers.</p>	<p>Training reports</p>	<p>Number of women and youth trained. Number of vocational training centers established. Number of microloans disbursed through VSLAs. Number of coastal enterprises linked to national and international markets. Percentage increase in household income from alternative livelihoods.</p>
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