

Adapting Together, Thriving Tomorrow



Ghana National Adaptation Plan

Monitoring and Reporting Framework



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ACRONYMS/ABBREVIATION

CSIR	Council of Scientific & Industrial Research
CSOs	Civil Society Organizations
EbA	Ecosystem-based Adaptation
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GGA	Global Goal on Adaptation
GSS	Government Statistical Service:
ICT	Information and Communication Technology
KPIs	Key Performance Indicators
M&R	Monitoring and Reporting
MESTI	The Ministry of Environment, Science, Technology, and Innovation
MMDAs	Metropolitan, Municipal, and District Assemblies
MoA	Ministry for Agriculture
MoF	Ministry of Finance
MTDPF	Medium-Term Development Policy Framework
NAP	National Adaptation Plan
NDCs	Nationally Determined Contributions
NDPC	National Development Planning Commission
SDGs	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction
ToC	Theory of Change
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WRC	Water Resources Commission

1. INTRODUCTION

1.1. Background & Context

Ghana is highly vulnerable to climate change due to its geographical location, economic dependence on climate-sensitive sectors such as agriculture and water, and the increasing frequency of extreme weather events. Rising temperatures, erratic rainfall, prolonged droughts, and devastating floods threaten food security, water availability, infrastructure resilience, and public health. These climate-induced disruptions pose significant risks to livelihoods, economic stability, and Ghana's ability to meet its Sustainable Development Goals (SDGs) and Nationally Determined Contributions (NDCs) under the Paris Agreement.

To address these challenges, Ghana has adopted various climate adaptation policies, including the National Adaptation Plan (NAP), which outlines strategic interventions across six priority sectors: **Agriculture, Cities, Ecosystems, Health, Youth, and Water**. However, effective adaptation requires a robust Monitoring and Reporting (M&R) framework to ensure accountability, transparency, and continuous learning. This document provides a structured system to track adaptation progress, assess sectoral effectiveness, and refine policies based on data-driven insights.

1.2. Purpose of the M&R Framework

The purpose of this M&R framework is to establish a systematic and integrated approach for monitoring adaptation implementation across multiple sectors. By standardizing data collection, defining performance indicators, and implementing feedback loops, the framework ensures that Ghana's adaptation efforts are measurable, transparent, and responsive to emerging climate risks. Specifically, the M&R framework aims to:

Improve adaptation performance tracking by collecting sector-specific data to assess resilience progress;

Provide actionable insights to support decision-making, allowing policymakers to refine strategies based on real-time climate adaptation metrics;

Strengthen institutional coordination by harmonizing M&R activities across government agencies, local authorities, and international stakeholders; and

Enhance transparency and reporting for both domestic oversight (e.g., Ghanaian Parliament) and global climate bodies such as the United Nations Framework Convention on Climate Change (UNFCCC).

1.3. Key Objectives

The framework is guided by three primary objectives to ensure Ghana's adaptation policies are effectively monitored and refined:

Systematic Monitoring of Adaptation Progress- Establishing a clear methodology for tracking resilience improvements across key sectors.

Transparent Reporting Mechanisms- Ensuring adaptation data is shared with stakeholders at local, national, and international levels.

Evidence-Based Policy Adjustments- Using M&R findings to refine adaptation strategies and allocate resources efficiently.

2. MONITORING & REPORTING FOR ADAPTATION IN GHANA

2.1. Review of the M&R Framework for adaptation

Monitoring and Reporting for climate adaptation in Ghana is implemented at national, sectoral, sub-national, and project levels, though coherence across these layers is still evolving. Ghana's National Adaptation Plan, along with sectoral strategies provide foundational M&R structures. However, there is no fully integrated, consolidated national M&R system that links all tiers of government and stakeholders under a unified framework. Most adaptation M&R efforts remain project-driven, especially where donor financing is involved.

Significant progress has been made in establishing a budget-linked M&R approach, including the development of the Climate Change Finance Tracking Tool and adaptation-relevant budget codes across over 30 ministries. This system supports the tagging of expenditures based on relevance to climate priorities. However, practical application at the local level remains inconsistent due to overlaps between development and adaptation goals and capacity constraints among Metropolitan, Municipal, and District Assemblies (MMDAs).

Ghana's National Development Planning Commission (NDPC) has integrated climate adaptation into the Medium-Term Development Policy Framework (MTDPF) and has provided M&R guidelines to support performance tracking. These guidelines include logical frameworks (log frames) and theory of change (ToC) elements that link adaptation inputs to outputs and long-term development outcomes. The NDPC, Environmental Protection Agency (EPA), and Ministry of Finance (MoF) play central roles in overseeing adaptation M&R, financial tracking, and national reporting.

Adaptation M&R in Ghana is increasingly aligned with international commitments, including:

- The Sustainable Development Goals (SDGs) – especially Goal 13 on Climate Action, with efforts to localize SDG indicators.
- The Sendai Framework for Disaster Risk Reduction (SFDRR) – through national disaster planning and monitoring.
- The Paris Agreement/NDCs – where Ghana has committed to reporting adaptation actions under its climate obligations.

Despite these linkages, data gaps, inconsistent indicator definitions, and weak local systems limit comprehensive tracking of climate adaptation outcomes across sectors. For example, while Ghana has begun integrating adaptation indicators into national surveys and digital platforms, local governments often lack the systems, skills, and tools to fully align with national or international reporting frameworks.

Each priority sector under Ghana's NAP, including agriculture, water, cities, and ecosystems uses sector-specific indicators and reporting formats. These are not always harmonized across ministries, creating fragmentation. The private sector, while recognized as a key stakeholder in adaptation, is not yet fully integrated into national adaptation M&R systems, with no mandatory reporting requirements for climate resilience investments.

To advance a more coherent and responsive adaptation M&R system, Ghana must:

- a. Develop a national coordination framework that integrates adaptation monitoring across all levels of government.
- b. Expand the use of ICT and remote sensing technologies to enhance real-time monitoring and reduce fragmentation.
- c. Ensure performance-based budgeting is linked with outcome-focused adaptation indicators, especially at the district level.

- d. Strengthen institutional capacities, especially for MMDAs, to ensure that adaptation indicators are collected, analyzed, and reported systematically.
- e. Align national adaptation M&R more explicitly with global frameworks, ensuring consistent and harmonized reporting to meet SDG, NDC, and SFDRR targets.

2.2. Institutional arrangements for climate change M&R in Ghana

2.2.1. Lead Coordination Body

The Ministry of Environment, Science, Technology, and Innovation (MESTI) will serve as the primary oversight institution, responsible for guiding Ghana's adaptation monitoring and reporting processes. It will coordinate sectoral ministries, ensure consistency in reporting formats, and validate climate adaptation data before submission to national and international platforms.

2.2.2. Key Implementing Institutions

Effective M&R requires collaboration between multiple government agencies, local governance structures, and external stakeholders to ensure adaptation activities are well-documented and properly analyzed.

A. National-Level Institutions:

- i. Environmental Protection Agency (EPA) – Leads climate adaptation impact assessments and ensures environmental sustainability.
- ii. National Development Planning Commission (NDPC) – Aligns adaptation performance tracking with Ghana's development goals and planning strategies.
- iii. Ministry of Finance (MoF) – Manages climate finance tracking to ensure funds are allocated to climate-smart initiatives.

B. Sectoral Ministries Responsible for Adaptation Implementation:

Each sector will oversee M&R activities for adaptation efforts within its jurisdiction:

- i. Ministry of Food & Agriculture – Tracks climate-smart farming, irrigation efficiency, and pest-resistant crop adoption.
- ii. Ministry of Local Government & Rural Development – Monitors urban resilience measures, sustainable city planning, and disaster risk reduction.
- iii. Forestry Commission – Reports on ecosystem conservation efforts, biodiversity protection, and climate-sensitive forestry management.
- iv. Ministry of Health – Assesses climate-sensitive disease trends, emergency preparedness, and climate health adaptation programs.
- v. Ministry of Youth & Sports – Monitors youth engagement in climate action, including education programs and employment initiatives.
- vi. Water Resources Commission – Tracks water conservation measures, improved access to climate-resilient water sources, and flood risk management.

C. Local Governance (District Assemblies):

Metropolitan, municipal, and district assemblies will support community-level adaptation monitoring by collecting local climate resilience data, engaging stakeholders in participatory reporting, and ensuring community adaptation efforts align with national targets.

2.2.3. Stakeholder Engagement Mechanisms

- i. To ensure effective adaptation tracking and institutional synergy, the M&R framework integrates stakeholder engagement mechanisms:
- ii. Multi-Sectoral Technical Committees – Coordinated collaboration among ministries, local governments, private entities, and academia.
- iii. Public-Private Partnership Reporting Systems – Incentivizing private sector involvement in climate adaptation financing and data reporting.
- iv. Capacity-Building Workshops – Providing M&R training for government officials and field data collectors to ensure consistency in reporting.

2.2.4. Development Partners

Development Partners such as the UNDP, Green Climate Fund (GCF), and the World Bank, play a crucial role in funding and co-designing climate adaptation initiatives in Ghana. Their involvement often brings in technical expertise and financial resources to support national and sub-national adaptation efforts. These partners require monitoring and reporting data from key institutions, including the Ministry of Finance, the Environmental Protection Agency, and sectoral ministries. However, many development partners apply their own reporting standards and formats, which can lead to misalignment with Ghana's national M&R systems and pose challenges for data integration and consistency.

2.2.5. Private Sector

The private sector, including businesses, investors, agribusiness entities, and infrastructure developers, contributes to climate adaptation by investing in resilient infrastructure, agricultural systems, and water resources. Despite its growing role, the private sector is generally not obligated to report on its adaptation-related investments. Nonetheless, with appropriate incentives or policy directives, these actors could begin reporting to national institutions like the EPA or the National Development Planning Commission. Public-Private Partnerships (PPPs), especially those facilitated through the MoF and relevant sector ministries, represent a strategic entry point for integrating private sector contributions into the broader national adaptation framework.

2.2.6. Civil Society Organizations and Academic Institutions

Civil Society Organizations (CSOs) and academic institutions serve as critical actors in Ghana's adaptation ecosystem by conducting climate research and promoting public advocacy. These groups often collaborate with local governments and development partners to implement or assess adaptation initiatives. However, their access to formal M&R data is limited, and their participation in national reporting processes is typically channeled through specific platforms or pilot projects rather than institutionalized roles. Enhancing their inclusion could strengthen the credibility and inclusiveness of adaptation monitoring and reporting.

Climate change related institutional arrangement in Ghana is summarized in **Figure 1** below.

Figure 1: Institutional arrangements for climate change M&R in Ghana

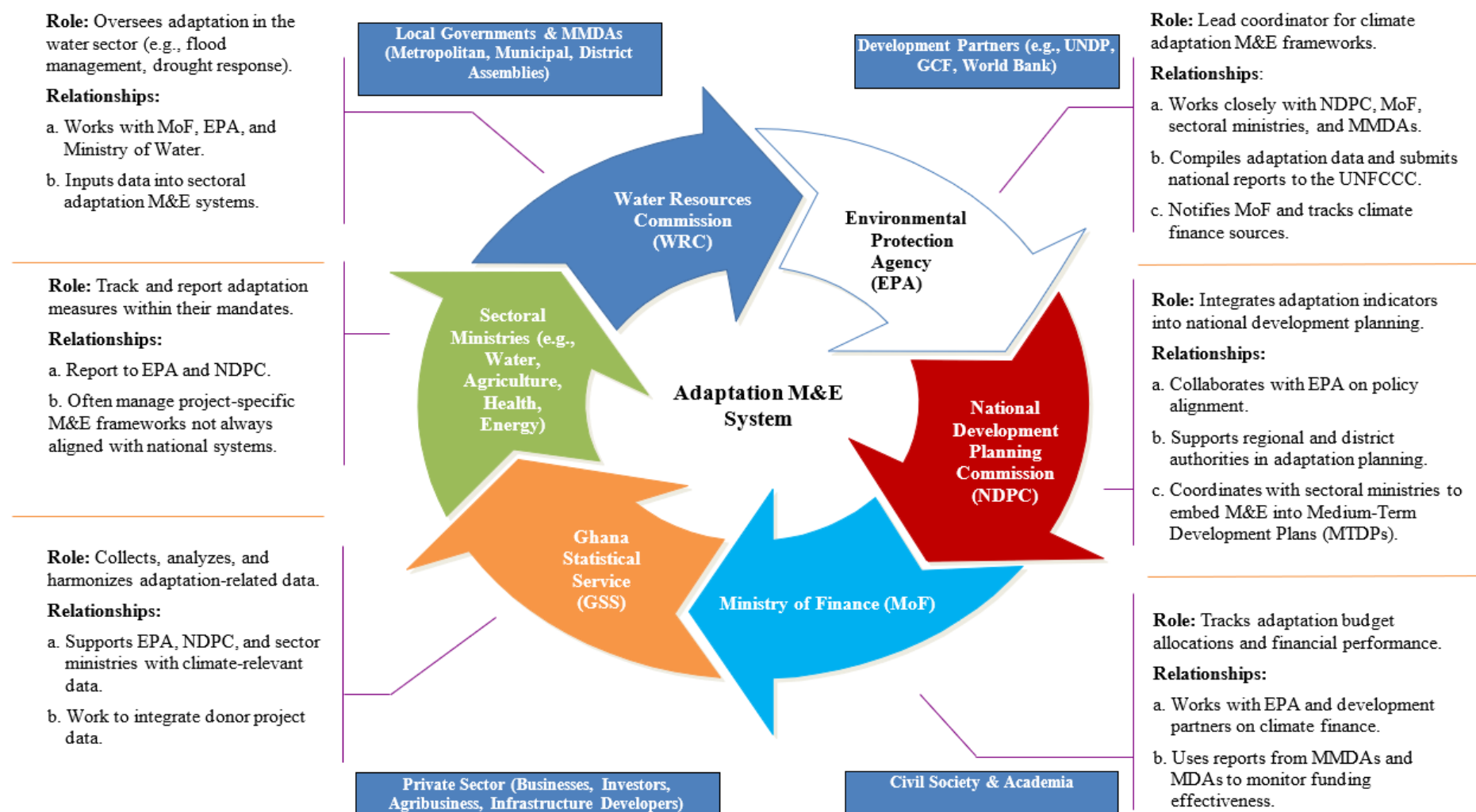


Table 1: Summary of Institutional Arrangements

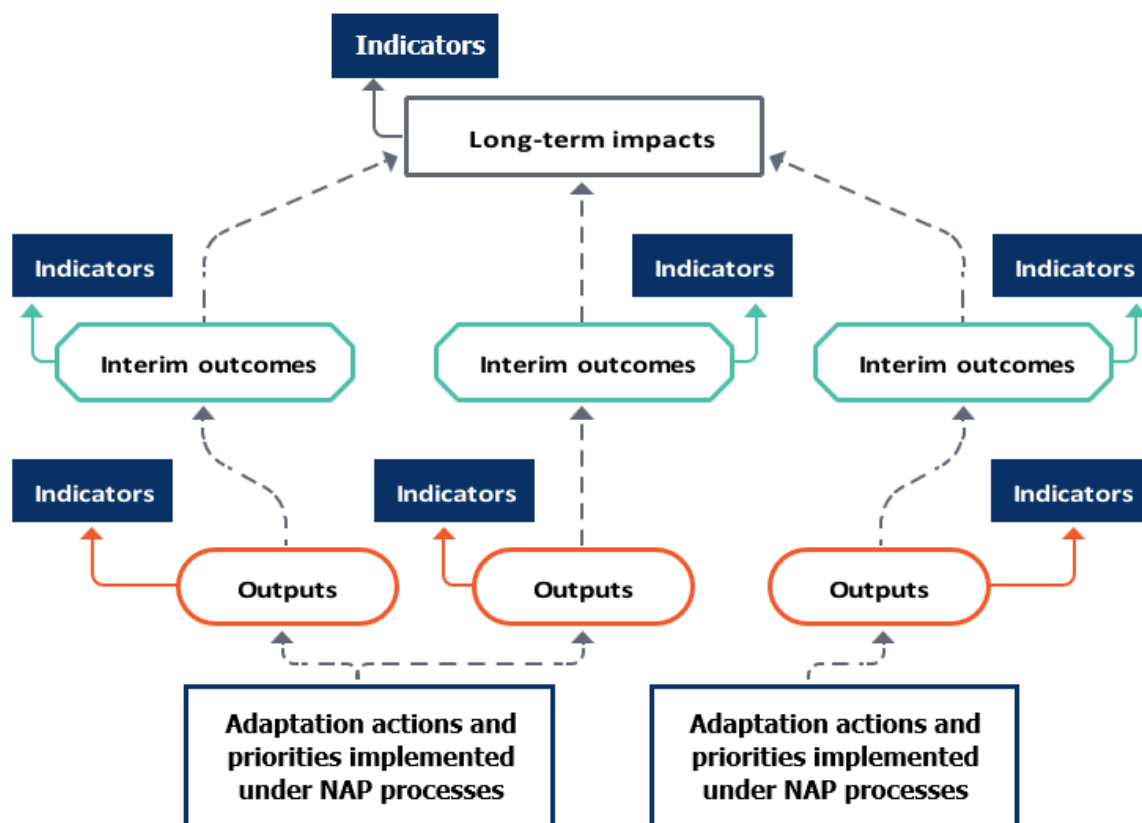
Institution	Reports to / Collaborates with	Key Functions
EPA	UNFCCC, NDPC, MoF, MMDAs	Coordination, reporting, M&R framework leadership
NDPC	EPA, Sector Ministries, MMDAs	Integration into development planning
MoF	EPA, Development Partners	Climate finance tracking and reporting
GSS	EPA, NDPC, Sector Ministries	National data collection and statistics
Sector Ministries	EPA, NDPC, GSS	Sector-specific monitoring
Water Resources Commission (WRC)	MoF, EPA, Water Ministry	Water sector adaptation
MMDAs	NDPC, EPA, Donors	Local adaptation implementation and monitoring
Development Partners	EPA, MoF, Sector Ministries	Fund and report on adaptation programs
Private Sector	MoF, Sector Ministries	Finance and implement adaptation measures
Civil Society & Academia	EPA, MMDAs, Development Partners	Data validation, research
Adaptation M&R System	All entities	Central tracking and coordination hub

2.3. Theory of Change

2.3.1. Defining Theory of Change for Ghana's NAP M&R

Theory of Change (ToC) is a structured approach that explains how and why a desired change is expected to happen in a specific context. It outlines the causal pathway from inputs and activities to outputs, outcomes, and long-term impacts, helping to clarify assumptions and guide planning, implementation, and reporting.

Figure 2: Theory of change structured along inputs, outputs, outcomes, and impacts



Source: Rolfe, 2019, adapted from Anderson, 2005

Ghana's NAP M&R framework is designed to systematically track the implementation, effectiveness, and learning outcomes of adaptation actions across all sectors and levels of governance. The theory of change underpinning the framework assumes that if clear institutional arrangements, robust data systems, and inclusive reporting mechanisms are established—supported by adequate capacity and financing—then adaptation actions can be effectively implemented, monitored, and refined over time. This will lead to improved evidence-based decision-making, greater stakeholder accountability, and more responsive, equitable adaptation planning. Ultimately, this will reduce vulnerability, strengthen resilience, and ensure climate adaptation efforts are integrated into national, sectoral, and local development priorities, contributing to sustainable development in a changing climate. The indicator tables in **Annex 1 to Annex 6 of the M&R Guidelines** describe the theory of change for each sector.

2.3.2. Indicators and Targets

The Theory of Change indicator matrix was developed by systematically translating the objectives, action steps, and success indicators outlined in the six (6) adaptation action plans for Agriculture, Cities, Ecosystems, Health, Youth and Water into a results-based monitoring framework. Each action was aligned with input, output, outcome, and short term - impact levels to ensure a clear results chain. While the NAPs provided qualitative indicators of success, these were expanded into measurable indicators across the results hierarchy.

Baselines and targets were developed through an interpretive review of the adaptation actions outlined in the six (6) NAPs, supported by contextual knowledge of Ghana's institutional capacities, past performance and sectoral benchmarks. Where quantitative data was lacking, informed estimates were derived using logical assumptions grounded in previous national reports, project evaluations, and policy documents. Targets were aligned with a long-term horizon (2026–2060), reflecting Ghana's strategic planning cycle, and calibrated to be ambitious yet feasible within resource, capacity, and coordination constraints. Each indicator's baseline represents the prevailing or approximate starting condition, while the targets reflect the intended level of change attributable to successful implementation.

1. As such, the baselines and targets used informed estimation based on:
2. The objectives in the action plans
3. Development baselines in Sub-Saharan African contexts (particularly Ghana NAP documents).
4. Industry standards and common progress benchmarks from projects funded by the UNDP, FAO, and national ministries and aligned with MDDAs, EPA, CSIR, and implementing partner mandates including Global Goal on Adaptation (GGA).
5. Logical extrapolation from the actions e.g., if a practice is being introduced, the assumption is that the baseline adoption is low (often <20%) and set ambitious but plausible 3 – 5 year targets (e.g., 60–80%) aligned with national adaptation planning goals.

The ToC matrix provides a structured foundation for future monitoring, reporting, and learning, and can be refined with validated baseline data. To make the framework fully evidence-based, we would need Baseline survey data, administrative records from MoA or CSIR and input from stakeholders.

3. SECTOR-SPECIFIC M&R FRAMEWORKS

3.1. Agriculture Sector M&R Framework

3.1.1. Sector Overview & Climate Challenges

Agriculture remains a critical pillar of Ghana's economy, contributing significantly to livelihoods, food security, and rural development. However, climate change poses severe risks, including droughts, unpredictable rainfall patterns, crop failure, soil degradation, and pests/diseases exacerbated by rising temperatures. The National Adaptation Plan prioritizes strengthening agricultural resilience through climate-smart farming practices, improved irrigation systems, and sustainable resource management.

3.1.2. Monitoring Indicators & Data Collection Methods

To assess Ghana's agricultural adaptation, see **Annex 1** for key performance indicators (KPIs) that will be tracked:

Table 2: Highlight of agriculture sector indicator tables

Indicator	Unit of Measurement	Baseline Value	Target Value (2025/2060)	Data Source	Reporting Frequency
Adoption rate of climate-smart farming	% of farms adopting adaptation strategies	40%	65% by 2060	Farmer surveys, MoA reports	Annual
Change in agricultural yield resilience	Metric tons per hectare	2.5	3.8 by 2060	Agriculture census, crop performance data	Bi-annual
Irrigation coverage for drought-prone areas	% coverage expansion	15%	30% by 2060	National water resource reports	Bi-annual
Soil quality improvements through conservation	pH balance, organic matter %	Baseline per region	20% improvement	Remote sensing, soil surveys	Annual
Reduced climate-related pest outbreaks	# of reported cases	500 cases	250 cases	Ministry of Agriculture data	Quarterly

3.1.3. Data Collection Methods:

- Field Surveys - Farmer questionnaires, extension service reports.
- Satellite Monitoring - Remote sensing for soil moisture levels, drought stress.
- Agricultural GIS Mapping - Spatial analysis of climate impacts on farmlands.
- Community-Level Assessments - Involvement of cooperatives and local agricultural boards.

3.1.4. Reporting Process

- Local-Level Reports- District agricultural officers submit quarterly data.
- National Sectoral Reports- Ministry of Food and Agriculture consolidates findings annually.
- Cross-Sector Integration- Comparison with water availability and ecosystem adaptation strategies.

3.1.5. Adaptive Management Strategies

- i. Policy Adjustments: Lessons from M&R will guide policy shifts, such as redirecting funds toward drought-resistant crops or pest control programs.
- ii. Capacity Building for Farmers: Training workshops on climate adaptation methods, soil health management, and early warning systems.
- iii. Technology Adoption: Scaling up mobile climate advisory tools for real-time adaptation guidance.

3.2. Cities Sector M&R Framework

3.2.1. Sector Overview & Climate Challenges

Urban areas in Ghana, particularly Accra, Kumasi, and Takoradi, face rising climate vulnerabilities, including extreme heat, flooding, infrastructure strain, and increased energy demand. Rapid urbanization coupled with weak climate resilience planning further exposes cities to environmental stressors. The NAP outlines strategies for urban adaptation through smart infrastructure development, green spaces expansion, flood management, and enhanced disaster preparedness.

3.2.2. Monitoring Indicators & Data Collection Methods

To monitor the cities' climate adaptation, see **annex 2** for key performance indicators (KPIs) that will be tracked:

Table 3: Highlight of cities sector indicator tables

Indicator	Unit of Measurement	Baseline Value	Target Value (2025/2060)	Data Source	Reporting Frequency
Urban flood-risk reduction measures	% reduction in flood impact areas	25%	50% by 2060	GIS flood mapping, hydrological reports	Annual
Expansion of green urban spaces	% increase in vegetated areas	12%	25% by 2060	Urban zoning regulations, city development plans	Bi-annual
Climate-proof infrastructure development	% of new urban projects climate-proofed	30%	60% by 2060	Municipal construction permits, resilience audits	Bi-annual
Improved drainage systems	% increase in drainage efficiency	Baseline by city	40% improvement	Water resources authority data	Annual
Disaster early warning systems	% of urban communities with active warning systems	55%	80% by 2060	Emergency services, meteorological data	Quarterly

3.2.3. Data Collection Methods

- i. Hydrological Surveys: Flood risk mapping using historical precipitation trends.
- ii. Urban Planning Assessments: Monitoring green spaces, drainage expansion, and smart infrastructure.
- iii. Satellite & Remote Sensing: Tracking urban heat islands and land-use changes.
- iv. City Disaster Reports: Compiling emergency response effectiveness in extreme weather events.

3.2.4. Reporting Process

- i. City-Level Climate Reports: Municipal adaptation units submit updates quarterly.
- ii. National Urban Adaptation Reports: Ministry of Local Government consolidates sectoral findings annually.
- iii. Comparative Analysis: Cross-sector data comparison with water conservation efforts and heat mitigation strategies.

3.2.5. Adaptive Management Strategies

- i. Policy Enhancements: Revising building codes for climate-proof urban designs.
- ii. Public Awareness Programs: Urban climate adaptation education via city councils.
- iii. Investment in Climate-Resilient Infrastructure: Expanding drainage networks and improving water supply systems.

3.3. Ecosystems Sector M&R Framework

3.3.1. Sector Overview & Climate Challenges

Ghana's ecosystems, including forests, wetlands, coastal zones, and biodiversity hotspots are highly vulnerable to climate change and human-induced environmental degradation. Rising temperatures, deforestation, unsustainable land-use practices, and extreme weather events threaten biodiversity, soil stability, water cycles, and carbon sequestration capacity. These changes jeopardize the livelihoods of rural communities' dependent on ecosystem services and increase risks of natural disasters, such as droughts and floods.

The National Adaptation Plan prioritizes ecosystem-based adaptation (EbA) by focusing on reforestation, conservation, sustainable land management, and habitat restoration. To track adaptation success, a robust Monitoring and Reporting system is essential.

3.3.2. Monitoring Indicators & Data Collection Methods

To monitor ecosystems adaptation, see **annex 3** for key performance indicators (KPIs) that will be tracked:

Table 4: Highlight of ecosystem sector indicator tables

Indicator	Unit of Measurement	Baseline Value	Target Value (2025/2060)	Data Source	Reporting Frequency
Forest cover restoration	% increase in forested land	45%	60% by 2060	Remote sensing, forestry commission reports	Annual
Rate of biodiversity loss reduction	Species population trends	Baseline per region	30% decrease in loss rates	Wildlife surveys, conservation research	Bi-annual
Wetland conservation coverage	% area protected	12%	25% by 2060	GIS mapping, ecological monitoring	Bi-annual
Community adoption of sustainable land management	% of rural areas implementing adaptation	Baseline across districts	50% adoption	Field surveys, satellite tracking	Quarterly

Carbon sequestration improvements	Tons of CO ₂ captured	Baseline national capacity	40% increase	Climate modeling, forestry commission data	Annual
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3.3.3. Data Collection Methods

- i. Remote Sensing & GIS Monitoring: Tracking deforestation, wetland depletion, and species migration patterns.
- ii. On-Ground Biodiversity Surveys: Field studies measuring ecosystem health indicators.
- iii. Community-Based Reporting: Local involvement in tracking forest restoration and land management adoption.
- iv. Carbon Capture & Emission Tracking: Analyzing shifts in Ghana's carbon sequestration ability.

3.3.4. Reporting Process

- i. Quarterly Reports: Local environmental officers submit biodiversity and conservation updates.
- ii. Annual Sectoral Reviews: National Forestry Commission compiles progress reports.
- iii. Cross-Sectoral Analysis: Alignment with agricultural adaptation, disaster risk reduction, and water security efforts.

3.3.5. Adaptive Management Strategies

- i. Policy Adjustments Based on M&R Findings: Enhancing conservation laws and ecosystem restoration incentives.
- ii. Ecological Education & Community Training: Strengthening capacity for sustainable land-use practices.
- iii. Expansion of Green Corridors: Connecting fragmented ecosystems through biodiversity-friendly infrastructure.

3.4. Health Sector M&R Framework

3.4.1. Sector Overview & Climate Challenges

Ghana's public health sector faces growing climate-related health risks, including increased infectious disease outbreaks, heat-related illnesses, food insecurity-driven malnutrition, and waterborne diseases. Rising temperatures exacerbate vector-borne diseases (malaria, dengue fever), air pollution-related respiratory illnesses, and heat stress in vulnerable populations.

The National Adaptation Plan (NAP) prioritizes climate-sensitive health adaptation by strengthening healthcare infrastructure, enhancing disease surveillance, expanding emergency preparedness, and ensuring food security interventions. Effective Monitoring and Reporting (M&R) is critical to track health resilience progress and inform policy responses.

3.4.2. Monitoring Indicators & Data Collection Methods

To track health adaptation, see annex 4 for key performance indicators (KPIs) that will be tracked:

Table 5: Highlight of Health sector indicator tables

Indicator	Unit of Measurement	Baseline Value	Target Value (2025/2060)	Data Source	Reporting Frequency
Reduction in climate-sensitive disease outbreaks	% decrease in reported cases	Malaria cases: 120,000/year	70,000 by 2060	Ghana Health Service, hospital records	Annual
Heat stress-related hospital admissions	% reduction in heat-related illnesses	25%	50% by 2060	Health surveillance data	Bi-annual
Improved access to climate-resilient healthcare facilities	% increase in coverage	Baseline by region	40% improvement	MoH records, facility assessments	Annual
Food security and nutrition adaptation	% of population with stable food sources	65%	85% by 2060	Agricultural health assessments	Bi-annual
Clean water access improvements	% of rural areas with safe drinking water	55%	90% by 2060	Water monitoring data	Annual

3.4.3. Data Collection Methods

- i. Hospital Surveillance Reports: Monitoring shifts in climate-sensitive health conditions.
- ii. Public Health Surveys: Assessing changes in heat stress, nutrition deficiencies, and disease trends.
- iii. GIS Mapping for Healthcare Access: Tracking healthcare facility expansion and availability.
- iv. Community-Based Data Collection: Engaging local clinics in real-time adaptation tracking.

3.4.4. Reporting Process

- i. Monthly Health Monitoring Reports: Hospitals and clinics submit disease trend data.
- ii. Quarterly M&R Reviews: Ministry of Health reports trends in climate-induced illness.
- iii. Annual Adaptation Performance Reports: Comprehensive national health system report.
- iv. Integration with International Health Frameworks: Aligning Ghana's adaptation monitoring with WHO climate-health standards.

3.4.5. Adaptive Management Strategies

- i. Disease Prevention & Response Programs: Expanding vector control strategies for malaria and dengue outbreaks.
- ii. Heat Preparedness Strategies: Creating urban cooling zones and public awareness campaigns.
- iii. Improved Rural Healthcare Infrastructure: Ensuring climate-resilient medical supply chains and facility accessibility.

3.5. Youth Sector M&R Framework

3.5.1. Sector Overview & Climate Challenges

Young people are central to Ghana's climate adaptation efforts. With over 57% of Ghana's population under the age of 25, the youth demographic presents both a challenge and an opportunity in climate resilience. The challenge lies in ensuring that young people are meaningfully engaged in adaptation efforts, while the opportunity involves leveraging their innovation, activism, and energy for climate-smart solutions.

Climate change disproportionately affects young people especially in rural communities, where extreme weather disrupts education, employment, and food security. Additionally, urban youth face risks from heat stress, air pollution, and infrastructure vulnerabilities. The National Adaptation Plan prioritizes youth involvement in climate action through education programs, capacity-building initiatives, entrepreneurship opportunities, and leadership roles in adaptation projects. A comprehensive M&R system is essential to track youth engagement in climate adaptation and ensure Ghana's strategies remain inclusive and effective.

3.5.2. Monitoring Indicators & Data Collection Methods

To monitor youth adaptation, see **annex 5** for key performance indicators (KPIs) that will be tracked:

Table 6: Highlight of youth sector indicator tables

Indicator	Unit of Measurement	Baseline Value	Target Value (2025/2060)	Data Source	Reporting Frequency
Number of youth participating in climate training programs	% of youth in structured adaptation education	10,000 annually	25,000 annually by 2060	Youth development reports, MoYS data	Annual
Integration of climate adaptation into school curricula	% of secondary schools implementing climate education	35%	80% by 2060	Ministry of Education reports	Bi-annual
Youth-led climate entrepreneurship projects	# of startups or initiatives	50 projects/year	150 projects/year by 2060	Business registration records	Bi-annual
Engagement of youth in policymaking	# of young people in formal climate policy roles	20 representatives	100 representatives by 2060	Government working group data	Quarterly
Employment of youth in adaptation sectors	% of green jobs created for youth	Baseline estimates	40% growth by 2060	Labor market assessments	Annual

3.5.3. Data Collection Methods

- Educational Institution Surveys: Tracking climate education adoption in schools and universities.
- Youth-Led Project Documentation: Collecting reports from funded entrepreneurship initiatives.
- Employment Tracking: Assessing job creation in climate adaptation sectors.
- Community-Based Engagement Reports: Monitoring grassroots youth participation.

3.5.4. Reporting Process

- i. Quarterly Sectoral Reports: Ministry of Youth and Sports compiles youth adaptation updates.
- ii. Annual Policy Reviews: reporting on youth engagements at governmental levels.
- iii. Integration with National Employment Strategies: Ensuring climate adaptation employment aligns with Ghana's job creation goals.

3.5.5. Adaptive Management Strategies

- i. Climate Leadership Training: Expanding mentorship programs for youth in adaptation sectors.
- ii. Support for Climate Startups: Enhancing access to funding for youth-led innovations.
- iii. Policy Representation Enhancement: Increasing youth voices in national adaptation decision-making.

3.6. Water Sector M&R Framework

3.6.1. Sector Overview & Climate Challenges

Water security is one of Ghana's most pressing climate adaptation challenges. Climate change has exacerbated water scarcity, contamination risks, flood damage, and inefficient resource management. Extreme weather events, including droughts and floods, threaten agricultural irrigation, access to drinking water and hydropower energy production. Additionally, urban areas experience drainage failures due to heavy rainfall, leading to sanitation issues and public health crises.

The NAP prioritizes water conservation, efficient water management, flood control, and enhanced infrastructure resilience. A robust M&R system is essential to track water-related adaptation measures, ensuring national water security goals are met.

3.6.2. Monitoring Indicators & Data Collection Methods

To track water adaptation, see **annex 6** for key performance indicators (KPIs) that will be tracked:

Table 7: Highlight of water sector indicator tables

Indicator	Unit of Measurement	Baseline Value	Target Value (2025/2060)	Data Source	Reporting Frequency
Expansion of climate-resilient water infrastructure	% of new water projects adapted for climate resilience	40%	70% by 2060	National water development reports	Annual
Increase in water efficiency through conservation measures	% reduction in water waste	20%	45% by 2060	Water management authority data	Bi-annual
Flood prevention infrastructure development	% of flood-prone areas protected	30%	60% by 2060	Hydrological reports, urban planning data	Annual
Access to clean drinking water in rural areas	% of population covered	65%	90% by 2060	Ministry of Water Resources	Bi-annual
Irrigation efficiency improvements for agriculture	% increase in climate-smart irrigation coverage	Baseline figures	40% improvement	Agricultural water reports	Annual

3.6.3. Data Collection Methods

- i. Hydrological Surveys: Tracking rainfall and flood patterns using GIS mapping.
- ii. Water Resource Monitoring Stations: Measuring water contamination levels and supply changes.
- iii. Satellite-Based Irrigation Tracking: Assessing agricultural water usage improvements.
- iv. Community-Led Water Reporting: Engaging local governments to monitor rural drinking water access.

3.6.4. Reporting Process

- i. Monthly Water Sector Reports: Ministry of Water Resources compiles adaptation progress.
- ii. Quarterly M&R Reviews: Assessing irrigation efficiency and flood control advancements.
- iii. Annual Adaptation Performance Reports: reporting on water conservation success at national levels.
- iv. Alignment with SDG 6 (Clean Water & Sanitation): Ensuring national water security commitments meet global development goals.

3.6.5. Adaptive Management Strategies

- i. Expansion of Climate-Resilient Water Policies: Strengthening national regulations to safeguard water supplies.
- ii. Technology Integration in Water Management: Advancing AI-based monitoring tools to improve conservation efficiency.
- iii. Community-Level Water Security Initiatives: Empowering local stakeholders with training programs for sustainable water resource management.

4. FINANCIAL M&R MECHANISM AND PROCESS IN GHANA

4.1. Financial Reporting Mechanisms

Effective climate adaptation requires structured financial oversight to ensure resources are optimally allocated to high-impact initiatives. The M&R framework integrates a multi-tier financial monitoring system, ensuring adaptation funds reach priority sectors efficiently, are transparently accounted for, and contribute to measurable resilience outcomes.

4.2. Climate Adaptation Budget Tracking System

Ghana's adaptation financing will be monitored through three mechanisms:

1. Government Budget Allocations: Annual funding provisions dedicated to adaptation projects, managed under the Ministry of Finance's climate expenditure framework.
2. International Climate Finance Contributions: Funds sourced from global climate initiatives, including the Green Climate Fund, the World Bank, UNDP, and other multilateral organizations.
3. Private Sector Investments: Corporate contributions toward climate-smart infrastructure, renewable energy development, and water resource conservation.

To ensure proper tracking, all adaptation finance will be linked to key performance indicators that demonstrate how investments translate into tangible resilience improvements.

4.3. Performance-Based Budgeting

4.3.1. Linking Financial Investments to Measurable Outcomes

The framework adopts a performance-based budgeting approach, ensuring adaptation funds are only allocated to projects with demonstrated impact. Ministries and agencies must meet measurable adaptation performance criteria before receiving continued financial support.

4.3.2. Sectoral Budget Allocation Monitoring

Adaptation financing will be monitored across the six priority sectors under Ghana's NAP, ensuring each receives adequate funding and produces clear adaptation results.

Table 8: Proposed performance-based budget for implementing Ghana's NAP

Sector	Budget Allocation 2023	Target Allocation 2025	Key Financial Performance Indicator
Agriculture	\$120M	\$160M	Increase in climate-smart farming adoption rates
Cities	\$95M	\$140M	% of urban areas with enhanced drainage & green infrastructure
Ecosystems	\$80M	\$125M	Expansion of reforested areas and biodiversity protection
Health	\$105M	\$135M	Reduction in climate-sensitive disease outbreaks
Youth	\$50M	\$85M	Increase in employment in climate adaptation initiatives
Water	\$110M	\$150M	% of rural communities with improved access to clean water

All budget reports to be reviewed annually, ensuring funds are used effectively and adaptation targets remain on track.

5. INTERNATIONAL REPORTING ALIGNMENT

5.1. Compliance with Global Climate Reporting Standards

5.1.1. The Paris Agreement & Nationally Determined Contributions (NDCs)

Ghana's adaptation strategies must align with global climate goals, particularly the Paris Agreement, which requires countries to report on progress in adaptation and mitigation efforts. The M&R framework will ensure Ghana's adaptation tracking supports its NDCs, providing data-driven insights into climate resilience achievements.

5.1.2. Alignment with the UN Sustainable Development Goals (SDGs)

Adaptation efforts are directly linked to SDG 13 (Climate Action), SDG 6 (Clean Water & Sanitation), SDG 2 (Zero Hunger), and SDG 11 (Sustainable Cities & Communities). All adaptation performance metrics will be benchmarked against SDG targets, ensuring Ghana remains in compliance with UN climate policy objectives.

5.1.3. Reporting to the United Nations Framework Convention on Climate Change (UNFCCC)

To fulfill international climate obligations, Ghana must submit periodic adaptation performance reports to the UNFCCC, detailing:

- i. Climate vulnerability trends and progress in resilience-building.
- ii. Financial investments toward adaptation initiatives.
- iii. Lessons learned from adaptation program implementation.

These reports will be compiled annually, using standardized templates for transparency and comparability.

6. TRANSPARENCY & ACCOUNTABILITY MEASURES

6.1. National Climate Finance Tracking Tools

Ghana will implement digital financial monitoring tools to ensure real-time transparency in adaptation funding allocations. Ministries will use blockchain-based finance tracking systems, ensuring that funds are not misallocated or lost within bureaucratic processes.

6.2. Public Access to Climate Finance Data

A National Adaptation Dashboard will provide public access to budget reports, allowing civil society organizations and independent researchers to review climate adaptation financing trends. This enhances accountability and stakeholder engagement.

6.3. Strengthened Audit Procedures

An independent climate finance oversight body will conduct external audits, verifying the accuracy and efficiency of adaptation investments. This guarantees that all funds contribute to legitimate resilience-building initiatives.

7. IMPLEMENTATION ROADMAP SECTORAL M&R FRAMEWORK/PLAN

7.1. Implementation Roadmap & Sector-Specific M&R Operational Strategies

7.1.1. Implementation Roadmap

To ensure a smooth and effective rollout of Ghana's adaptation M&R framework, implementation is divided into three strategic phases:

Phase 1: Planning & Stakeholder Alignment (Year 1 - 2)

Key Activities:

1. Institutional capacity-building workshops for data collection and analysis.
2. Establishment of sector-specific M&R technical committees.
3. Integration of adaptation performance indicators into existing governance structures.
4. Deployment of data collection technologies (GIS, digital reporting tools).
5. Finalization of sector-specific climate adaptation baseline assessments.

Phase 2: System Deployment & Active Monitoring (Year 3 - 5)

Key Activities:

1. Full activation of climate adaptation performance tracking.
2. Training programs for local governments and M&R teams.
3. Initial adaptation progress reporting and adjustments based on findings.
4. Regular stakeholder feedback loops to refine monitoring protocols.

Phase 3: Reporting, Policy Refinement & Scaling (Year 6 - 10)

Key Activities:

1. Mid-term reports of sectoral adaptation success.
2. Policy adjustments based on findings from performance monitoring.
3. Expansion of climate adaptation strategies to high-risk regions identified in reports.
4. Development of long-term financing plans for climate adaptation sustainability.

7.1.2. Sector-Specific M&R Operational Strategies

Each sector will have defined roles and responsibilities for adaptation monitoring and reporting.

National-Level Oversight:

- Ministry of Environment, Science, Technology & Innovation: Leads national policy coordination.
- National Development Planning Commission: Ensures alignment with economic development priorities.
- Environmental Protection Agency: Conducts climate impact assessments and adaptation audits.
- Ministry of Finance: Tracks climate adaptation financial performance.

Sectoral Monitoring Strategies: Each ministry will directly oversee its respective sectoral adaptation M&R operations:

- **Agriculture:** Monitoring climate-smart farming adoption, irrigation efficiency, and food security improvements.
- **Cities:** Tracking urban flood prevention measures, green space expansion, and infrastructure resilience.
- **Ecosystems:** Assessing biodiversity health, reforestation programs, and protected area management.
- **Health:** Reporting climate-sensitive disease trends, emergency preparedness strategies, and heat stress mitigation.
- **Youth:** Reporting on youth participation in adaptation programs, climate entrepreneurship, and employment creation.
- **Water:** Measuring access to clean water, flood control effectiveness, and sustainable water governance practices.

7.1.3. Monitoring & Reporting Mechanisms

To ensure structured adaptation tracking, the framework will operate under four-tiered reporting cycles:

Table 9: Reporting Mechanisms for Ghana's NAP

Reporting Level	Reporting Frequency	Responsible Institution	Key Performance Areas
Local-Level Reports	Quarterly	District Assemblies	Community adaptation implementation
Sectoral Performance Reviews	Bi-Annual	Sector Ministries	Agriculture, Cities, Ecosystems, Health, Youth and Water
National Adaptation Reports	Annual	NDPC & EPA	Overall adaptation strategy progress
International Climate Reporting	Every 2 years	MESTI & UNFCCC Delegation	Paris Agreement & SDG compliance

7.1.4. Risk Management & Contingency Planning

A. Identifying Key Adaptation Risks

Adaptation projects face several risks, including:

1. Insufficient financial resources where budget shortages may disrupt implementation.
2. Data collection challenges resulting in weak infrastructure which could hinder real-time reporting.
3. Institutional coordination gaps thus overlapping mandates and slow policy execution.
4. Climate shocks lead to unexpected extreme weather events that may demand adaptive strategy shifts.

B. Contingency Planning Mechanisms

To mitigate implementation risks, Ghana's adaptation M&R framework incorporates proactive contingency strategies:

1. Flexible Budgeting- Emergency reserve funds for climate disasters.
2. Cross-Sector Collaboration- Enhanced coordination between ministries.
3. Community-Based Early Warning Systems- Engaging local populations in adaptation response strategies.
4. Real-Time Policy Adjustments- Adaptive governance protocols based on climate intelligence reports.

8. CONCLUSION

This Monitoring and Reporting (M&R) framework for Ghana's adaptation initiatives provides a structured and coordinated approach to track progress, enhance accountability, and ensure climate resilience across key sectors. By integrating clearly defined input, output, outcome, and impact indicators, alongside measurable baselines and targets, this framework enables institutions at national, regional, and local levels to monitor adaptation effectiveness, align with international commitments (e.g., UNFCCC, SDGs), and improve decision-making based on evidence. With strong inter-institutional collaboration, robust data systems, and continuous learning loops, Ghana is positioned to build a climate-resilient development pathway that is inclusive, transparent, and responsive to both current and future risks.

