2025

INTOSAI Working Group on Environmental Auditing

INTOSAI IDI DEVELOPMENT INITIATIVE

Global Climate Adaptation Audits for a Resilient Future:

Lessons and recommendations from Supreme Audit Institutions

Message from the Director General of the IDI

I am pleased to present to you this IDI-INTOSAI WGEA publication: “Global Climate Adaptation Audits for a resilient future: Lessons and recommendations from Supreme Audit Institutions”.

While climate change affects each country, its impact on those in challenging and vulnerable contexts, especially the Small Island Developing States (SIDS) is severe. Responding to the expressed need for audit responses to climate change adaptation actions, IDI and WGEA came together to facilitate a Global Cooperative Audit of Climate Change Adaptation Actions (CCAA).

I am pleased to see that this cooperative audit brought together 54 SAIs from diverse contexts to provide, both, oversight and insights into the climate change adaptation actions taken by their governments. The audits cover areas like disaster risk reduction, water resource management, sea level rise and coastal erosion and implementation of climate change adaptation plans. I take this opportunity to congratulate all SAIs which have successfully completed these audits. I would especially like to commend those SAIs that conducted these audits for the first time, despite capacity and resource constraints.

This publication demonstrates the value that SAIs can contribute. I am pleased to see that not only have we achieved the objective of contributing positively to effective climate change adaptation, but we have also started the journey of supporting SAIs in building long term capacities to audit climate adaptation action on a regular basis.

We are thankful to WGEA for their solid partnership, and to SAIs and stakeholders who provided financial and in-kind contribution for this initiative.

For us at IDI this is significant milestone in supporting SAI contribution to climate action. While much is achieved, much remains to be done. We remain committed to working together to promote and support SAI contribution to climate action. I take this opportunity to call on SAIs, governments and stakeholders to come together and act on the key messages that this publication delivers to ensure effective, accountable and inclusive climate adaptation action for the benefit of all.

Einar Gørrissen

Einar Gørrissen
Director General, INTOSAI
Development Initiative

Message From the INTOSAI WGEA Chair

Climate change affects all countries– some more urgently than others. Effective adaptation is not only a response to current risks, but also a forward-looking investment that helps avoid far greater costs in the future.

This report stands as a testament to the power of global collaboration. Supreme Audit Institutions (SAIs) from around the world have joined forces through the IDI-WGEA global cooperative audit, sharing insights and expertise to enhance climate change adaptation through public sector external auditing.

The findings of the collective work highlight both progress and persistent challenges: fragmented governance, funding gaps, and the pressing need for inclusive and accountable adaptation. At the same time, SAIs have identified good practices, offered actionable recommendations, and demonstrated that systematic, transparent adaptation is not only necessary—but achievable.

As climate risks intensify, the lessons and examples presented in this report underscore the value of united action and shared learning. Through collaboration, SAIs empower governments to strengthen resilience and deliver lasting impact for all.

I extend my sincere thanks to all participating SAIs and their mentors, as well as the developers of the e-learning materials within the INTOSAI WGEA and IDI communities. Your contributions have been instrumental in advancing this important work.

Sami Yläoutinen

Dr. Sami Yläoutinen
Auditor General of Finland, Chair of the INTOSAI WGEA

Abbreviations

ASOSAI	Asian Organisation of Supreme Audit Institutions
AFROSAI-E	African Organisation of Supreme Audit Institutions-English
CAROSAI	Caribbean Organisation of Supreme Audit Institutions
CCAA	Climate Change Adaptation Actions
EUROSAI	European Organisation of Supreme Audit Institutions
IPCC	Intergovernmental Panel on Climate Change
IDI	INTOSAI Development Initiative
INTOSAI	International Organisation of Supreme Audit Institutions
NAP	National Adaptation Plan
NGO	Non-Governmental Organisation
OLACEFS	Organisation of Latin American and Caribbean Supreme Audit Institutions
PASAI	Pacific Association of Supreme Audit Institutions
SAI	Supreme Audit Institution
SIDS	Small Island Developing States
UNFCCC	United Nations Framework Convention on Climate Change
INTOSAI WGEA	INTOSAI Working Group on Environmental Auditing

About the INTOSAI and the IDI-WGEA Global Cooperative Audit of Climate Change Adaptation Actions (CCAA) Initiative

INTOSAI (International Organisation of Supreme Audit Institutions) is the global umbrella organisation for public sector auditing. It supports Supreme Audit Institutions (SAIs) in enhancing transparency, accountability, and good governance worldwide.

The **IDI** (INTOSAI Development Initiative) and the **INTOSAI WGEA** (INTOSAI Working Group on Environmental Auditing) collaborate to strengthen the environmental auditing capacity among SAIs. One of their flagship efforts is the CCAA Audit Initiative—a cooperative audit programme focused on climate change adaptation actions.

The **CCAA** Audit initiative brings together more than 50 SAIs from diverse regions to assess how governments plan, implement, and monitor climate adaptation efforts. Through shared methodologies, peer learning, and joint reporting, the initiative aims to:

- Highlight good practices and common challenges in climate adaptation governance.
- Promote inclusive, risk-informed, and coordinated adaptation strategies.
- Provide actionable insights for national and global stakeholders.

Two primary objectives of the CCAA audits are that -

1. SAI audits contribute to improved governance, effectiveness, and inclusivity of the government's climate change adaptation actions, and
2. SAIs enhanced their capacities to conduct high-quality and high-impact audits of climate change adaptation actions.

Part 1 of this publication presents key findings, country cases, and strategic messages from the CCAA cooperative audits, covering the first objective, by offering a unique global perspective on the effectiveness of climate change adaptation actions.

Part 2 of this publication highlights how the CCAA audit initiative strengthened SAI capacities by conducting audits of climate change adaptation actions, addressing the second objective.

Table of Contents

Part 1- Findings, country cases, and key messages from the CCAA audits

Part 2 - CCAA Audits: Strengthening SAI Capacities

PART ONE

Findings, country cases, and key messages from the CCAA audits

1. Strengthening Climate Change Adaptation Through Auditing

1.1. Key messages to governments, global stakeholders and SAIs

Adaptation is urgent, as climate change poses new types of risks to economies, communities, and public budgets. Governments must develop strategies that foster resilience and are financially sustainable, enabling them to adapt to changing conditions.

Supreme Audit Institutions (SAIs), as external auditors of the government, can identify weaknesses, highlight best practices, and support continuous improvement in the planning, financing, and implementation of adaptation measures.

Findings from IDI-WGEA global cooperative performance audits show that real progress is possible when adaptation is approached systematically. Based on the CCAA audit reports, the following recommendations are offered to governments, international partners, and the audit community.

Key messages to governments

- **Assess risks comprehensively:** Create data-driven and inclusive risk assessments and integrate them into planning and budgeting.
- **Plan strategically:** Develop clear, coordinated, and budget-aligned adaptation plans with defined roles, timelines, and measurable goals.
- **Coordinate well:** Establish coordination mechanisms with clearly defined roles and mainstream adaptation planning and actions across the government sectors and levels.
- **Implement effectively:** Ensure strong leadership, oversight, and institutional capacity to translate plans into action.
- **Include everyone:** Engage people, including vulnerable groups and local communities, as well as indigenous peoples, meaningfully throughout planning and implementation.
- **Finance wisely:** Establish national climate finance strategies, use tools like budget tagging, and prioritise high-risk sectors and vulnerable populations.
- **Monitor and learn:** Build adaptive monitoring and evaluation systems, even if imperfect, to track progress and improve over time.
- **Take action:** Regularly assess adaptation progress and take action to address any problems and issues identified.

Key messages to the United Nations and other International Stakeholders

- **Focus on supporting the implementation of NAPs and monitoring progress:** While national adaptation plans are increasingly being adopted, their impact will remain limited without more substantial support for implementation and rigorous monitoring.
- **Bridge budgetary gaps:** There is a significant mismatch between the financial needs outlined in NAPs and the resources currently available. Donors and international partners should recognise these shortfalls and commit to closing the gap through predictable, adequate, and accessible funding.
- **Finance strategically, not fragmentally:** Climate finance should be guided by a strategic, long-term vision aligned with national priorities. Avoid piecemeal project funding and instead invest in integrated, scalable solutions that promote coherence, sustainability, and impact.
- **Support inclusiveness:** Fund mechanisms that empower local communities and ensure participation of marginalised groups.
- **Simplify access:** Streamline funding processes and build recipient countries' capacity to access and manage climate finance.
- **Promote transparency:** Encourage the use of financial tracking tools and cost-effectiveness analysis to ensure accountability.
- **Enable learning:** Support knowledge-sharing platforms and showcase with examples what successful adaptation looks like.

Key messages to SAIs

- **Assess planning and implementation of plans:** Review whether adaptation plans are specific, coordinated, and linked to budgets, and whether implementation is progressing as intended.
- **Examine the implementation gap:** Investigate whether well-designed adaptation plans are being effectively translated into action.
- **Audit inclusiveness:** Examine whether adaptation efforts involve vulnerable populations and assess the effectiveness of participation mechanisms.
- **Examine coordination:** Pay attention to coordination mechanisms and policy coherence across government levels and agencies.
- **Evaluate finance:** Scrutinise the transparency, equity, and efficiency of climate finance flows and the use of financial tools.
- **Strengthen monitoring and evaluation:** Promote the development of monitoring systems using process-based metrics and encourage regular audits to improve adaptation outcomes.
- **Be proactive:** Use audits not only to identify gaps but also to highlight good practices and support continuous improvement in adaptation governance.

1.2. IDI-WGEA Global Cooperative Audit of Climate Change Adaptation Actions

SAIs are independent organisations that can conduct financial, compliance and performance audits. Through performance audits, SAIs assess the economy, efficiency, and effectiveness of public spending and policy implementation, helping governments identify gaps, improve accountability, and promote transparency. In addition to identifying challenges, SAIs also highlight good practices and success stories.

SAIs have previously engaged in climate-related audits, including a global cooperative audit on climate change, led by INTOSAI WGEA in 2010, as well as numerous regional efforts. While many of these early audits focused on climate change mitigation, interest in adaptation has increased over the past few years. Another ongoing global effort is the ClimateScanner, which facilitates rapid reviews on climate governance, public policies and climate finance. These cooperative efforts complement each other.

Recent INTOSAI-WGEA surveys indicate the growing interest of SAIs in climate change. In 2021, climate change adaptation was considered a top priority for SAIs. To respond to SAIs' needs, in 2022, the IDI and WGEA launched a global cooperative audit, allowing SAIs to select their audit topic from four thematic areas:

- Climate change adaptation planning and actions
- Water resources management
- Disaster risk reduction
- Sea level rise and coastal erosion

ROLL OUTS IN ENGLISH, SPANISH AND ARABIC

PARTICIPANT COUNTRIES

54 SAIS

287 PARTICIPANTS

Climate change adaptation planning and actions	Water resources management	Disaster risk reduction	Sea level rise and coastal erosion
Albania	Bhutan	Lesotho	Bahamas
Croatia	Philippines	Nigeria	Marshall Islands
Ireland	Vanuatu	Sierra Leone	New Caledonia
Malta	Namibia	Slovenia	Solomon Islands
Fiji	Uganda	Ukraine	Tuvalu
FSM	Andorra	Argentina	Colombia
Samoa	Cyprus	Panama	
Botswana	Portugal	Brazil	
Kenya	Brazil	Chile	
Madagascar	St. Kitts and Nevis		
Tanzania	Paraguay		
Indonesia	Cuba		
Maldives	Ecuador		
Vietnam			
China			
Brazil			
Canada			
Jamaica			
St. Kitts and Nevis			
Tonga			
El Salvador			
Mexico			
Bolivia			

Climate change is a particularly well-suited topic for cooperative audits due to its global nature: it makes no difference where greenhouse gases are emitted – they all accumulate in our shared atmosphere. This means that actions should be collective. Climate change affects all regions of the world, although some regions are more severely impacted than others. As a result, the need for adaptation is genuinely global. In addition, there are international frameworks, such as the Paris Agreement, adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC), the Sendai Framework for Disaster Risk Reduction, and the Sustainable Development Goals (SDGs), which provide common reference points for action. For auditing, international frameworks also provide common sources for audit criteria. For example, in the audits in this project, most of the SAIs used the Paris Agreement.

1.3. Governance, Accountability, and Inclusion in Adaptation

The SAIs examined these three cross-cutting issues while conducting their audits on any of the four thematic areas:

GOVERNANCE	EFFECTIVENESS	INCLUSIVENESS
Environmental governance encompasses policies, rules, and norms that govern human behaviour, and it also addresses who makes decisions, how decisions are made and implemented, the scientific information required for decision-making, and how the public and major stakeholders can participate in the decision-making process. (UNEP)	As a performance audit, CCAA is expected to focus on the 3Es of economy, efficiency, and effectiveness. Effectiveness is meeting the objectives set and achieving the intended results. Effectiveness deals with outputs, results, or impacts. It is about the extent to which policy objectives have been met in terms of the generated output. It is concerned with the relationship between goals or objectives on the one hand and outcomes on the other.	Refers to the process of improving the terms for individuals and groups, in particular for those marginalised / in danger of being left behind, to take part in society and to be able to benefit adequately from climate change adaptation actions. The aim is to leave no one behind and to incorporate measures in public spending for climate change adaptation actions that enhance the ability, opportunity, and dignity of those marginalised or potentially marginalised due to climate change. Marginalisation may differ depending on the country context.

A key role for SAIs is to hold governments to account for their public spending. Performance audits help by looking beyond financial auditing, asking whether planned objectives have been met. Consequently, assessing the **effectiveness** of climate adaptation involves determining whether adaptation objectives have been met and the intended results achieved. This report includes many audit findings of effectiveness issues, but also successful cases.

Accountability is closely related to transparency. For example, monitoring and evaluation, by providing status infor-mation on adaptation actions, fosters transparency. Adaptation, however, is not an easy topic to monitor, as investments extend into the future and aim to avoid costs and mitigate climate change risks in the longer term. As this report argues, this difficulty is no reason to stop building monitoring systems. Instead, it offers suggestions on where to start.

Accountability and transparency are also closely linked to good governance. The audits summarised in this report cover various aspects of governance, including policies, rules, and norms, as well as the processes for making deci-sions, the information required for decision-making, and participation in the decision-making process. One specific aspect here is the need for policy coherence across government levels and entities. The need for cross-sector co-ordination is also strongly present in the adaptation audit findings of this cooperative audit.

Finally, adaptation governance is not only about government actions. It is rooted in the everyday lives of communities, households and individuals. Therefore, adaptation planning and actions need to be inclusive. The need for **inclusiveness** in adaptation measures and responses is one of the strongest messages from the audits in this project. Inclusiveness means hearing all voices, also those that are marginalised or in danger of being left behind.

Based on the survey sent to the participating SAIs, they had assessed governance and effectiveness thoroughly.

This cooperative audit focuses on adaptation worldwide for the first time. It encompasses 54 performance audits from all INTOSAI regions.

2. Strengths, Shortfalls, and the Path to Effective Adaptation | Key Insights

Climate change adaptation is no longer a future concern—it is a present imperative. Adaptation is essential for reducing vulnerability and building resilience. It enables societies to prepare for and respond to climate risks—such as floods, droughts, sea-level rise, and heatwaves—while protecting the most affected populations.

As climate impacts intensify across regions, governments must respond with urgency, clarity, and inclusiveness. Effective adaptation requires strategic planning, inclusive governance, adequate financing, and robust monitoring systems. SAIs play a critical role in evaluating whether governments are meeting these requirements.

The following sections describe key steps in effective climate change adaptation, highlight related challenges and opportunities identified in the CCAA audits, and provide examples from the audits that illustrate some of the opportunities and challenges.

2.1. Understanding the Climate Threat | Risk Assessment

- Ireland: Risk-Informed Adaptation Governance

Ireland offers a strong example of how risk assessments can inform adaptive governance. Its sectoral adaptation plan for flood risk management includes regular updates to flood maps and infrastructure risk assessments. The Climate Change Advisory Council uses an adaptation scorecard to evaluate progress, which identifies risk, prioritisation and adaptive capacity as key topics for assessment. The flood risk management sector has been scored as achieving good or advanced progress in this area in the last four years.

- Why is risk assessment important for adaptation?

Effective climate adaptation begins with a clear understanding of the risks. Risk assessment is the foundation for identifying who and what is most vulnerable, as well as for guiding targeted, evidence-based actions and responses.

Risk assessments provide a clear understanding of the potential hazards, exposure, and vulnerability that communities or systems face, helping to understand their climate risks. By systematically identifying and evaluating risks, such as extreme heat, droughts, and flooding, these assessments provide crucial information that supports decision-makers in prioritising adaptation actions, allocating resources efficiently, and developing targeted strategies to reduce potential impacts. Without thorough, up-to-date risk assessments, there is a risk of ineffective adaptation planning and investments, as well as maladaptation, which ultimately increases vulnerability. Without robust, up-to-date risk assessments, adaptation planning becomes reactive and misaligned with actual threats.

Challenges

- **Outdated or incomplete data**: Many assessments relied on old census data or lacked disaggregated information on vulnerable populations.
- **Fragmentation**: Risk assessments were often sector-specific and not harmonised across ministries or regions.
- **Lack of institutionalisation**: In many countries, risk assessments were either missing or not integrated into planning and budgeting processes.
- **Limited use in decision-making**: Even where assessments existed, they were not always used to inform adaptation strategies or resource allocation.

Opportunities

To accelerate progress, audit findings suggest countries should:

- **Institutionalise Risk Frameworks**: Develop or update national, continuous, data-driven risk assessment frameworks using the latest climate science and socio-economic data and ensure they are legally mandated and funded
- **Mainstream into governance**: Integrate risk assessments into planning, budgeting and decision-making at all levels of government.
- **Ensure inclusiveness and capacity**: Promote inclusive participation in risk identification, especially for marginalised and high-risk communities, by incorporating gender, age, income, and geographic vulnerability into assessments and building technical capacity within ministries and local governments to conduct and use risk assessments effectively.

- Gaps and Progress in Climate Risk Assessments Across SAIs

SAI Croatia found that its government had conducted science-based assessments using climate modelling and sectoral analysis in 2017. However, these assessments were not fully updated or inclusive of all vulnerable groups, such as the elderly or low-income populations. In contrast, Brazil lacked a structured risk assessment for agriculture, which undermined its ability to identify and address sectoral vulnerabilities.

Malta's first economy-wide Climate Vulnerability and Risk Assessment (VRA), completed in 2025 mainly due to data and knowledge gaps, represents the first comprehensive effort to examine the interplay between climate change impacts and the socio-economic realities of the Maltese Islands. Furthermore, in line with the requirements of the EU Floods Directive, the Government has carried out the relevant flood risk assessment.

However, this did not reflect the most recent demographic changes, possibly weakening the relevance of adaptation priorities. In parallel, governmental entities undertook various projects aimed at addressing potential flooding and sea level rise. For instance, the GiFLUID project, which included the development of a modelling tool assessing the effectiveness of different sustainable infrastructure options, including green roofs.

Albania's climate response is hindered by the absence of a centralised data system, limited technical staff, and insufficient funding. With no national monitoring framework in place, only 15% of adaptation measures were fully implemented between 2019 and 2023. A lack of risk assessment tools further impedes prioritisation. However, Albania stands out for explicitly budgeting 45.5 million ALL (Albanian Lek) for gender equality in adaptation—a rare example of gender mainstreaming in climate finance.

Canada's National Adaptation Strategy lacked a systematic approach to prioritising climate risks. The 2019 risk assessment had significant gaps, including the limited inclusion of Indigenous knowledge and the absence of a regular update process. Without a risk-based foundation, the strategy struggled to target and prioritise urgent threats.

In Chile, the audit showed that out of 16 regional disaster risk reduction (DRR) plans, only two (Valparaíso and Los Ríos) even mention heatwaves—and none include concrete actions or vulnerability assessments related to extreme heat. This is particularly relevant given Chile's increasing frequency of heatwaves and the fact that 90% of its population resides in urban areas, which are highly exposed to heat-related risks.

2.2. Building the Foundation for Action | Planning

- Tanzania's Well-Designed Adaptation Plan Faces Gaps in Capacity and Data Integration

In Tanzania, the climate change adaptation plan—formally known as the National Climate Change Response Strategy (2026–2021)—was designed as a comprehensive framework to build resilience across vulnerable sectors, including agriculture, water, and energy. The strategy aligned with international commitments such as the Paris Agreement and emphasised sustainable development, low-emission pathways, and inclusive adaptation measures.

However, the performance audit on the Implementation of Climate Change Adaptation Actions in Tanzania conducted by the National Audit Office found that while the Plan was well-conceived, it did not sufficiently reach communities on the ground. Capacity-building efforts were sporadic, and both central and local governments lacked adequate resources and training to implement adaptation actions. The absence of a centralised data system and stakeholder platforms further hindered transparency and accountability in the implementation of climate change adaptation actions.

- Why is planning important for adaptation?

Adaptation planning provides a crucial mechanism for government entities to prepare for and manage climate change risks proactively. Such planning provides a strategic framework to translate information about climate risks into actionable, prioritised, and funded measures. Adaptation planning can occur at various levels of government or within specific sectors. To be effective, adaptation planning should be coordinated across levels of government and sectors, and aligned with national development goals and international commitments, such as the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, and the Sustainable Development Goals.

The CCAA audits covered adaptation planning at various levels. One of the CCAA audit themes focused specifically on national-level adaptation planning that applies across the government and encompasses all sectors. In these audits, SAIs found that most countries had developed national adaptation plans. Audits that focused on the other CCAA themes—water resource management, sea level rise and coastal erosion, and disaster risk reduction—often addressed adaptation planning within a particular sector, which was typically the responsibility of a specific ministry or agency. SAIs found that the extent of planning varied among the different sectors and countries covered in these audits.

Regardless of the level at which adaptation planning was evaluated, SAIs generally found that effective plans had clear objectives, roles, priorities, and budgets. The audits identified some common challenges that various countries faced in adaptation planning at all levels, which hindered the effectiveness of planning and subsequent implementation of the plans. The audits also identified opportunities for government entities to address these challenges.

Challenges

- **Lack of Specificity.** In several instances, SAIs found that adaptation planning lacked the specific operational details needed for effective implementation. For example, some plans did not sufficiently include assigned responsibilities, timeframes, and performance indicators or measurable milestones.
- **Fragmentation.** Several SAIs found that adaptation planning was often fragmented and not sufficiently coordinated among levels of government. For example, in some instances, a gap existed between national adaptation policies and the local implementation of actions. In other cases, planning across various sectors was not coordinated or did not fully include vulnerable groups.
- **Limited Alignment of Priorities with Budgets.** Some SAIs found that adaptation plans did not adequately link priority actions with budgets and did not comprehensively convey the estimated costs of planned adaptation or the economic risks associated with not implementing adaptation actions.

Opportunities

- **Define Specifics.** Adaptation plans should include clear, realistic, and measurable goals, as well as established timelines and responsibilities.
- **Establish Mechanisms for Coordination.** Government entities should ensure that plans are coherent among national, regional, and local authorities, as well as between various sectors. Planning should be inclusive and include all relevant stakeholders, especially vulnerable groups and local communities who are disproportionately affected by the adverse consequences of climate change.
- **Support the Local Level.** National governments can provide guidance, technical support, and incentives for local governments to develop adaptation plans.
- **Prioritise Actions.** Government entities should use economic analyses and vulnerability assessments to help prioritise adaptation actions, understand economic trade-offs, and avoid maladaptation.

- Adaptation Planning in Practice

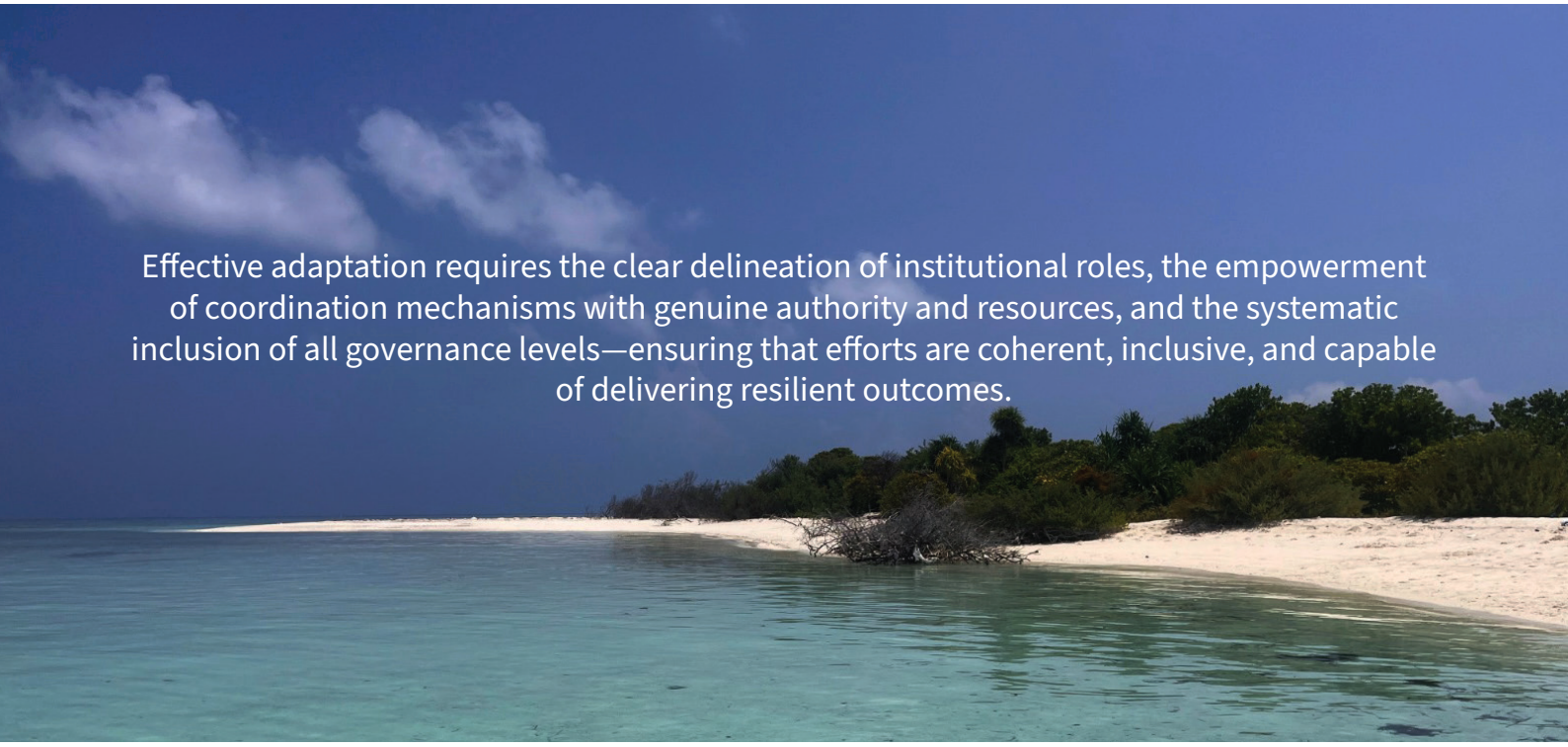
In Tonga, the audit revealed that the government had a detailed plan of action for Tonga's climate change adaptation work for the period from 2018 to 2028. The planning included key actions, key institutions and their roles and responsibilities, and monitoring and reporting mechanisms.

Albania has a National Adaptation Plan that includes a strategic framework for climate adaptation actions; however, the plan lacks operational detail, is fragmented, and lacks institutionalisation. The audit found that the lack of continuity and integration undermines long-term adaptation efforts.

In Croatia, the government adopted a Climate Change Adaptation Strategy in 2020 for the period up to 2040 with a view to 2070. The strategy included 83 adaptation measures across eight sectors and two cross-sectoral areas. However, an action plan to operationalise the strategy, which was required by June 2021, had not been adopted by the time of the audit.

In St. Kitts & Nevis, a National Climate Change Adaptation Strategy and Action Plan exists, but it needs to be revised to include measurable milestones for adaptation actions, as well as evidence-based priorities and budgeting.

In Cyprus, adaptation actions are scattered among various plans (e.g., National Strategy for Adaptation, Drought Management Plan, River Basin Management Plan). The audit concluded that adaptation planning is fragmented and lacks prioritisation based on impact and feasibility. This is reflected, for example, in the underutilization of recycled water: although the infrastructure has the capacity to support 53.9 million cubic meters annually, only 28.2 million cubic meters were produced in 2023. The low uptake, despite availability for irrigation since 1998, is mainly due to disjointed planning regarding the connection of communities and households with wastewater treatment plants.



2.3. Aligning Institutions | Roles, Responsibilities, and Coordination

- Fragmented Governance in Climate Adaptation: The Indonesian Case

Indonesia's audit on climate adaptation highlights how weak coordination can undermine national climate goals. The formal National Adaptation Plan and sectoral strategies are still being developed, but fragmented governance has led to delays and inefficiencies. Ministries operate with misaligned priorities, and responsibilities within key programmes—such as reforestation—remain unclear. A climate risk assessment tool lacks critical spatial data due to poor inter-agency collaboration, and funding gaps persist despite the need for coordinated financial planning. At the subnational level, many regional governments have not integrated adaptation into their development plans, reflecting a disconnect between national policy and local implementation. The case illustrates that without effective coordination across sectors and levels of government, even well-designed adaptation strategies struggle to achieve their intended results.

- Why is coordination important for adaptation?

Adaptation planning requires a clear articulation of roles, responsibilities, and coordination mechanisms to be effective. Without these, adaptation efforts can be fragmented, inefficient, and ultimately, less successful in adapting to our changing climate. Clear roles and responsibilities, strong leadership, and accountability are needed to align and improve adaptation actions across society. This can also help avoid maladaptation and enhance resilience.

Strong governance mechanisms will increase programme coherence and ensure clear accountability in making progress. Adaptation governance mechanisms can bring together governments with differing jurisdictions, Indigenous Peoples and marginalised groups. Clearly establishing roles and responsibilities ensures coordinated action both horizontally at the national level and vertically with sub-national actors. Effective governance supports decisions to address climate impacts that are currently occurring (e.g., heatwaves, wildfires, and floods) and slow-onset changes that will intensify over time (e.g., sea-level rise, habitat change, and thawing permafrost). Both immediate and slow-onset changes can impact an individual's sense of place, culture, identity, and mental health and well-being. Effective governance also helps reduce the risk that actions in one jurisdiction do not become a barrier or compromise solutions for adaptation in others.

Challenges

- Multiple institutions often share similar responsibilities without clear delineation, leading to duplication, confusion, or neglect of critical tasks.
- National platforms or inter-agency committees exist in name but lack the authority, funding, or operational capacity to convene stakeholders and drive coordinated action.
- Subnational actors are frequently left out of national planning and implementation processes, despite being essential for localised adaptation delivery.
- Data sharing, joint planning, and feedback mechanisms between ministries and agencies are weak or non-existent, resulting in fragmented efforts and missed opportunities for synergy.

Opportunities

- Clarify institutional mandates and responsibilities through legal or policy instruments.
- Establish or reactivate coordination platforms with clear authority, resources, and regular convening schedules.
- Strengthen vertical coordination between national, regional, and local actors.
- Improve inter-agency communication and data-sharing protocols, including joint planning and reporting.
- Ensure inclusive coordination that involves civil society, the private sector, and vulnerable communities.
- Conduct stakeholder mapping to identify gaps and overlaps in institutional roles.
- Build the capacity of local authorities to participate meaningfully in coordination and implementation.

- Coordination Gaps in Climate Adaptation

SAI Brazil found that, due to the Sectoral Plan for Climate Change Adaptation and Low Carbon Emission in Agriculture Plan (ABC Plan) being established by an ordinance of the Ministry of Agriculture, Livestock, and Supply (MAPA) and the planned control and alignment forums not being active, there was no proper institutionalization and governance structuring of the Plan at the federal level, with the recognition of roles and responsibilities by agencies and entities outside the MAPA structure. This led to low execution of actions by other federal entities or to the execution of actions without linkage to the ABC+ Plan. Existing plans do not focus on the adaptation of agriculture as a whole but rather on isolated production systems. Family farmers are the most vulnerable, but the Ministry of Agrarian Development was not included in adaptation planning.

In Malta, the Climate Action Act of 2024 marked a significant step forward in climate governance, resulting in a stronger framework for coordinated action, mainly through the establishment of a Climate Action Authority. Moreover, the National Climate Action Council, composed of experts from various domains, serves as an independent advisory body, providing strategic guidance. Additionally, each Ministry's principal executive acts as the Climate Action Coordinator to ensure better cross-governmental engagement.

China leads globally in photovoltaic capacity (886 GW), with 42% from distributed systems. However, extreme weather—hail, snow, and heatwaves—damages PV infrastructure and disrupts power generation. The audit found that photovoltaic development and power grid development are not fully coordinated, which reduces the grid's climate adaptability under high load. Distributed PV systems, widely integrated into China's rural grids, complement large-scale centralised facilities thanks to their decentralised setup and flexible adjustment. Grid construction typically requires three to five years. In contrast, large-scale PV power-station construction generally takes two years, leading—at times—to a mismatch in development timelines in some regions. To adapt to the rapid growth of the photovoltaic industry, China is continually enhancing its national recycling system for decommissioned photovoltaic panels to prevent illegal dismantling and associated pollution risks.

SAI Vietnam found that the NAP was developed under the leadership of the Ministry of Natural Resources and Environment, with participation from several ministries and sectors. However, key ministries such as the Ministry of Foreign Affairs and the Ministry of Justice were not included in the drafting process. It also found that coordination with other agencies and localities was limited or ineffective, and institutional roles were not clearly defined or operationalised, leading to fragmented implementation.

The audit in Tonga found that the integration of the Joint National Action Plan-2 on Climate Change and Disaster Risk Management 2018-2028 actions was not always clear in the corporate plans of implementing ministries. The audit concluded that roles and responsibilities should be implemented and regularly reviewed to ensure they are effective, transparent, and without duplication. On a positive note, Tonga established a National Climate Change Roundtable to coordinate donor funding and align efforts. This is a model for transparent climate finance governance.

Despite 71% of New Caledonia's coastline being at risk of erosion, no unified coastal risk prevention plans exist, and legal protections don't apply to customary lands. The audit found that in Ouvéa, as throughout the territory, aid and projects were not subject to any overall referencing, management or coordination. Each project was carried out independently and in isolation. The audit concluded that New Caledonia needs to strengthen its integrated coastal management capacity and enhance coordination among stakeholders.

2.4. Elevating Global and Local Voices | Inclusiveness

- Tuvalu – Inclusive Coastal Adaptation

Early improvements to livelihoods and local ecosystems in Tuvalu were made possible through the reclaimed land, allowing people to plant trees, cultivate gardens, and utilise the land for walks, fishing, swimming, sports, and other social activities. The Tuvalu Coastal Adaptation Project shaped infrastructure and land use to reflect community needs through inclusive consultations, including those with marginalised groups and people with disabilities. Island councils (Kaupules) and communities were actively involved in identifying priorities, implementing actions, and monitoring results. The audit found that this participatory approach built trust, enhanced local stewardship, encouraged responsible management practices and helped ensure that the reclaimed land meets the needs and expectations of its users.

- Why is inclusiveness important for adaptation?

People's lives are disrupted by climate change and measures to adapt to it. They can lose their homes, land and community connections, all of which they have built up and rely on for their livelihoods and wellbeing. Strong cultural ties and customary rights may be at risk of being broken. The effects on some people, such as indigenous peoples, women, children and rural communities, may be greater.

For these reasons, it is critical to include those affected in the planning and implementation of adaptation actions. Inclusion fosters trust and empowers the people affected to take ownership of their actions. It helps to ensure that their needs and rights are understood and considered, their ideas about effective solutions are incorporated into adaptation actions, and they are involved in realising and sustaining the intended benefits. All of which means that adaptation actions are more likely to be successful.

When people are not adequately included, well-intended actions can have unintended consequences.

Challenges

- **Limited engagement.** Some audits found strong engagement, including with local communities and specific demographic groups, and particularly in planning adaptation actions. In the main, the audits found that engagement was insufficient, particularly in ongoing participation and reporting on actions, as well as with local stakeholders and Indigenous communities. There were missed opportunities to leverage civil society expertise and resources, and instances where poor engagement had undermined the effectiveness and equity of adaptation efforts, resulting in resistance and implementation delays.
- **Low awareness.** Overall, the audits found that awareness of climate change and adaptation actions was not inclusive or widespread enough. Awareness was limited at local levels among communities and local officials, especially in rural areas. Where awareness existed, it was primarily project-based. Some audits concluded that awareness was insufficient to support adaptation, as a lack of awareness reduced public support and ownership of adaptation actions, and limited uptake of adaptation initiatives.
- **Inconsistent participation.** Some of the audits identified mechanisms for citizen participation, as well as instances where citizens and specific demographic groups participated in activities such as project workshops and training sessions. In the main, the audits found that participation mechanisms were insufficient and ineffective, and public participation was limited and inconsistent, including for indigenous peoples. Some communities, such as vulnerable rural communities, and local institutions are not empowered to participate meaningfully.

Opportunities

- **Structured stakeholder engagement.** Government entities should take a systematic approach to continuous stakeholder engagement. This should include citizens, civil society and vulnerable groups throughout the planning and implementation of adaptation actions. They should use mechanisms such as stakeholder mapping, communication plans, targeted engagement programmes, and clear and transparent project selection procedures to enable effective inclusion. These mechanisms will raise awareness of adaptation actions, enable inclusive decision-making, and promote the ongoing involvement of stakeholders in the successful realisation of sustained benefits from these actions.
- **Community-led adaptation.** Government entities should seek to support community-led adaptation actions through funding, capacity building, and technical assistance, thereby enabling communities to plan and implement practical, effective actions. These types of initiatives can be effective in tailoring adaptation actions to reflect the specific circumstances and context of individuals, thereby meeting community needs.
- **Monitor inclusiveness.** Government entities should establish indicators and mechanisms to monitor inclusiveness in the planning and implementation of adaptation actions, including specific measures for vulnerable populations. Collecting and monitoring data on inclusiveness will help government entities to ensure they are reaching and including people through consultations, engagement and participation.

- Audit Reflections on Community Engagement

Argentina's adaptation initiatives included a pilot programme, Mesas Territoriales Agroclimáticas (MTA), to engage local stakeholders in identifying climate risks and needs.

These participatory meetings were held in three provinces during 2021 but were discontinued in 2022. The audit revealed that, although the initiative showed potential, overall participation was limited. Moreover, the mechanisms implemented by the national prevention and mitigation system in place were insufficient to identify and prioritise vulnerable producers, which weakened the equity and inclusiveness of the system.

Colombia's Coastal Erosion Master Plan (PMEC) was designed with inclusive principles, aiming to involve communities through education and participation. However, the audit revealed a gap between planning and implementation: most communities were unaware of the plan, and their involvement in decision-making was minimal. A survey conducted in 11 Caribbean communities confirmed the severe impact of erosion on their livelihoods and the need for relocation for many families, highlighting the need for improved management in terms of inclusion and outreach.

Despite these challenges, no structured community participation was observed in the planning processes, undermining the plan's inclusive intent. The audit evidence recognises actions and progress, but confirms, particularly in vulnerable regions such as San Andrés, Chocó, and the Caribbean, a lack of effective governance, inter-institutional coordination, and outreach, which limits communities' ability to contribute to and benefit from adaptation measures. Therefore, it is crucial to implement a comprehensive approach that ensures genuine inclusion and fosters community engagement to address coastal erosion and its socioeconomic implications effectively.

In Vanuatu, the national Drinking Water Supply and Security Planning approach involves providing communities with the skills and technical support necessary to adopt and sustain good water management practices tailored to their specific circumstances and requirements. Through this approach, the Department of Water Resources (DoWR) has laid the foundation to ensure water safety and involve communities in the sustainable management of its water resources.

DoWR has prioritised community engagement, focusing on vulnerable communities. This will further enhance Vanuatu's resilience to climate change impacts on its fragile water resources and help ensure that 'no one is left behind'. DoWR's service delivery approach involves community triggering, meaning that communities identify their water needs and request assistance from DoWR. Not all communities face the same challenges. 'Erakor Half Road' showcases the benefits of effective partnerships with NGOs, which have contributed to the establishment of more resilient water systems. Other communities have developed their own solutions, including protective by-laws that safeguard water sources and household water fee systems that fund ongoing maintenance. These local success stories provide valuable models that could be adapted elsewhere across Vanuatu's islands.

The audit concluded that without meaningful participation, adaptation measures risk overlooking local knowledge and failing to gain long-term community support. In this case, unresolved compensation issues led to the withdrawal of funding for later segments of the river wall, halting construction before it could begin.

2.5. Delivering on Adaptation Plans | Implementation

- Mexico's Adaptation Planning Stalls in Implementation and Monitoring

Mexico's Programa Especial de Cambio Climático (PECC) 2024–2021 laid out a structured four-phase adaptation process: vulnerability analysis, design of measures, implementation, and monitoring. However, the audit revealed that while the planning documents were well-articulated, implementation lagged significantly.

In 2023, the Policy for National Adaptation (PNA) was still under development, and no database of implemented adaptation measures existed. Although 86 adaptation actions were reported, it was unclear how many were aligned with the PECC or targeted the most vulnerable municipalities. Moreover, no clear budget allocation for adaptation could be identified within the 192 billion pesos spent under climate-related programmes.

The audit also found that annual work programmes for adaptation design were missing, and monitoring and evaluation mechanisms were underdeveloped, with no indicators to assess the impact of adaptation efforts on reducing vulnerability.

- Why is implementation important for adaptation?

Implementation is the critical phase in which adaptation plans are translated into real-world actions. Of course, successful implementation first requires a functioning and well-designed plan. However, even the most well-designed adaptation plans may fail to deliver impact without effective implementation. Effective implementation ensures that investments in planning, risk assessment, and stakeholder engagement result in tangible benefits for communities and ecosystems.

In most CCAA audits, SAIs found that the implementation of adaptation actions was often slow and incomplete. Although in a few countries, SAIs found that the implementation of adaptation actions was progressing successfully. The audit results indicated that countries tended to have more success when adaptation measures were prioritised, aligned with risk assessments, and time-bound. The audits highlighted various challenges and opportunities for improving the implementation of adaptation efforts.

Challenges

- **Governance Gaps.** A lack of leadership, oversight, and accountability hindered the implementation of adaptation efforts.
- **Disjointed Efforts.** In some cases, adaptation efforts were based on individual projects, without a larger vision, or the efforts lacked alignment with risk assessments. For example, adaptation efforts were driven by development policies, rather than climate risks, without linking development and adaptation needs. Such disjointed efforts limited the impact of adaptation efforts.
- **Limited Capacity and Guidance.** The implementation of many adaptation efforts was limited by insufficient capacity, including the required financial and technical capacity to complete the effort. Additionally, in some instances, the entities responsible for implementing the effort lacked adequate guidance.

Opportunities

- **Provide Solid Support.** By ensuring sufficient oversight, legal backing, enforcement, and community understanding and support of the adaptation efforts, government entities can help ensure their success. This can also include providing post-implementation support and revisiting adaptation needs.
- **Improve Coordination.** Effective coordination among relevant institutions responsible for implementing adaptation efforts is crucial for success. Coordination can be improved, for example, by formalising roles and responsibilities and institutionalising adaptation strategies. Effective coordination between implementing agencies and funders is also essential.
- **Enhance Capacity.** Technical capacity for implementing adaptation efforts can be enhanced by developing standard procedures, mainstreaming adaptation efforts into existing processes and procedures, and providing sufficient staff training.

- Plans Exist, Implementation Lags

In Saint Kitts & Nevis, where the audit focused on water resources management on the island of Nevis, the government has taken proactive steps to implement some actions specified in the National Climate Change Adaptation Strategy. For example, the Nevis Island Administration government has made recent efforts aimed at strengthening the resilience of the water supply to changes in precipitation. However, the audit found that the implementation of adaptation actions was limited by factors such as insufficient staffing and inadequate resources.

Ireland's flood risk management sectoral adaptation plan identifies 21 actions to help achieve adaptation goals and assigns responsibility to various organisations and stakeholder groups for implementing each of the actions. Ireland's Office of Public Works utilises a progress tracker to monitor 67 sub-actions under the 21 main actions, as well as five interim indicators to measure implementation progress. They have shown that implementation is progressing, but has been limited in certain areas.

In Brazil, the audit found that insufficient coordination between the federal government and subnational entities hindered the implementation of adaptation actions. The audit reported that communication between the federal government, states, and civil society needs to be improved to ensure greater effectiveness in implementing adaptation actions.

In the Marshall Islands, a low-lying atoll nation facing an existential threat from sea level rise, the government has constructed seawalls to protect the population from the impacts of sea level rise and flooding. The audit found that seawall constructions in Ebeye and Santo, Kwajalein Atoll, were completed in accordance with an implementation plan that included specific tasks, phases of work, and timeframes for completion. By contrast, the construction of some seawalls on Majuro commenced but was never completed. The construction of these seawalls lacked a formal implementation plan that detailed tasks and timeframes for completing the work.

In Ecuador, Escuelas del Agua (Water Schools) are planned as community education hubs for climate adaptation, but are not yet operational.

Fiji has relocated several communities due to climate risks (e.g. Vunidogoloa, Tukuraki). Early relocations often lacked basic amenities, such as kitchens and washrooms, and some villagers returned to their old sites due to cultural ties or accessibility issues.

In alignment with the Sendai Framework's emphasis on inclusive early warning systems, Sierra Leone's responsible agency launched the 1199 toll-free line to improve disaster reporting—but the audit revealed serious issues with responsiveness, staffing, and network coverage, undermining its effectiveness in timely emergency response.

2.6. Mobilising Support for Adaptation | Climate Finance & Resources

- Ukraine's Climate Resilience Efforts Weakened by Lack of Systematic Risk Assessment and Budget Constraints

Ukraine has developed several strategies and operational plans for climate change adaptation, including sectoral assessments and regional initiatives. However, the audit of the Accounting Chamber of Ukraine revealed a critical gap: insufficient and fragmented financing undermines the implementation of these plans.

Despite the approval of the Environmental Safety and Climate Change Adaptation Strategy up to 2030 and its operational plan for 2024–2022, many measures remain only partially implemented due to limited budget allocations. For example, regional material reserves for emergency response were funded at an average of only %59.2. Sectoral reserves in key agencies such as the State Water Resources Agency and the State Forest Resources Agency were not established at all.

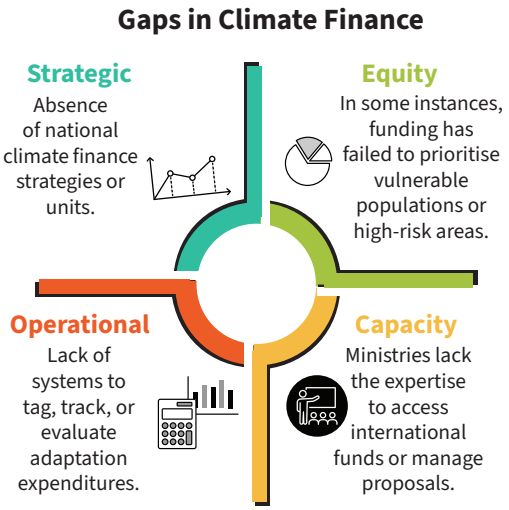
Moreover, although Ukraine has developed separate methodologies and strategic frameworks for climate risk assessment, including in forestry and water resources, the lack of a unified risk assessment system limits the ability to forecast and prepare for emergencies. Climate vulnerability assessments were conducted in only 7 out of 24 regions. This means that financial resources are not systematically directed to the highest-risk territories or sectors.

The audit emphasised that the full-scale military aggression of the Russian Federation has significantly complicated monitoring and diverted considerable state resources to priority needs, leaving adaptation measures insufficiently supported and underfunded.

- Why is climate finance important for adaptation?

Climate finance is essential to the successful implementation of climate change adaptation strategies. It enables governments and institutions to translate policy into action by operationalising national adaptation plans, funding resilient infrastructure, and supporting vulnerable communities.

In the context of increasing climate risks, particularly for low-income and climate-vulnerable countries, access to international climate funds such as the Green Climate Fund (GCF), the Global Environment Facility (GEF), and the Adaptation Fund has become a critical enabler. While significant challenges remain in the availability and accessibility of adaptation finance, the effectiveness of such funding also depends on strategic planning, institutional capacity, and sound financial management systems.



Challenges

Audits have revealed a range of gaps in strategic planning, operations, equity, and institutional capacity that hinder the optimisation of climate finance for adaptation. One recurring issue is the absence of dedicated climate finance strategies. Many governments lack adequate mechanisms to track spending on climate adaptation, resulting in the inefficient allocation of resources and undermining the overall impact of national adaptation efforts.

Another significant challenge is the limited availability and often inadequate level of domestic funding for urgent adaptation needs. This situation has resulted in a heavy reliance on international climate finance. However, governments frequently struggle with the complexity of funding mechanisms and face lengthy approval processes. Institutional capacity within many agencies remains limited, affecting their ability to apply for, mobilise, manage, and monitor climate funds effectively.

The under-utilisation of financial tools such as budget tagging and cost-effectiveness analysis is another critical concern. These tools are essential for ensuring transparency, accountability, and strategic allocation of resources. The absence of cost-benefit analysis further compounds these challenges by preventing decision-makers from comparing the relative value of different adaptation options. Consequently, there have been cases where funding fails to prioritise the most vulnerable populations or address the areas at highest risk.

Opportunities

In conclusion, improving climate finance for adaptation requires a comprehensive and strategic approach. Countries should develop and implement national climate finance strategies that align closely with their adaptation priorities. Systems for tagging, tracking, and evaluating adaptation expenditures must be implemented to ensure greater transparency and accountability.

It is equally essential that funding mechanisms are designed to prioritise high-risk sectors and the most vulnerable populations, ensuring equitable and impactful outcomes. Institutional capacity should be strengthened through targeted training and sustained support, while access to climate finance should be improved to ensure the timely and effective implementation of urgent adaptation measures. Furthermore, conducting cost-benefit and cost-effectiveness analyses will help guide strategic decision-making and ensure optimal use of available resources.

By addressing these key areas, countries can build a more resilient, responsive, and efficient climate finance system that supports long-term and sustainable adaptation outcomes.

- Audit Insights on Funding Gaps and Opportunities

Climate Finance Enablers

Climate Finance units

Establish climate finance units and national authorities. These units help manage climate finance.

Budget tracking systems

Implement budget tagging to monitor adaptation spending. This ensures transparency in resource allocation.

Funding Strategies

Develop multisource funding strategies for climate initiatives. Including domestic, international, and private climate finance.

Capacity-building

Provide capacity-building for government entities to access and manage climate finance.

In the Federated States of Micronesia, there is no established and centralised financing structure system for donor-funded climate change projects. There is an uncoordinated approach to implementing climate change actions funded by various donors that poses the risk of missed opportunities to secure financing for climate actions. More specifically, the Department of Environment, Climate Change, and Emergency Management requires a grant writer to develop grant proposals addressing identified climate finance needs, thereby effectively and efficiently accessing environmental and climate change funds.

Indonesia's use of REDD+ (Reducing emissions from Deforestation and Forest Degradation) and carbon markets shows potential for innovative funding mechanisms. While initiatives like the Forest Carbon Partnership Facility and the BioCarbon Fund have achieved verified emission reductions, their impact is limited by slow disbursement of funds and administrative hurdles. Regulatory uncertainties and unmet additionality criteria for private sector contributions hinder the realisation of their full potential. They require clearer standards, better coordination, and enhanced capacity to become reliable tools for climate adaptation and mitigation.

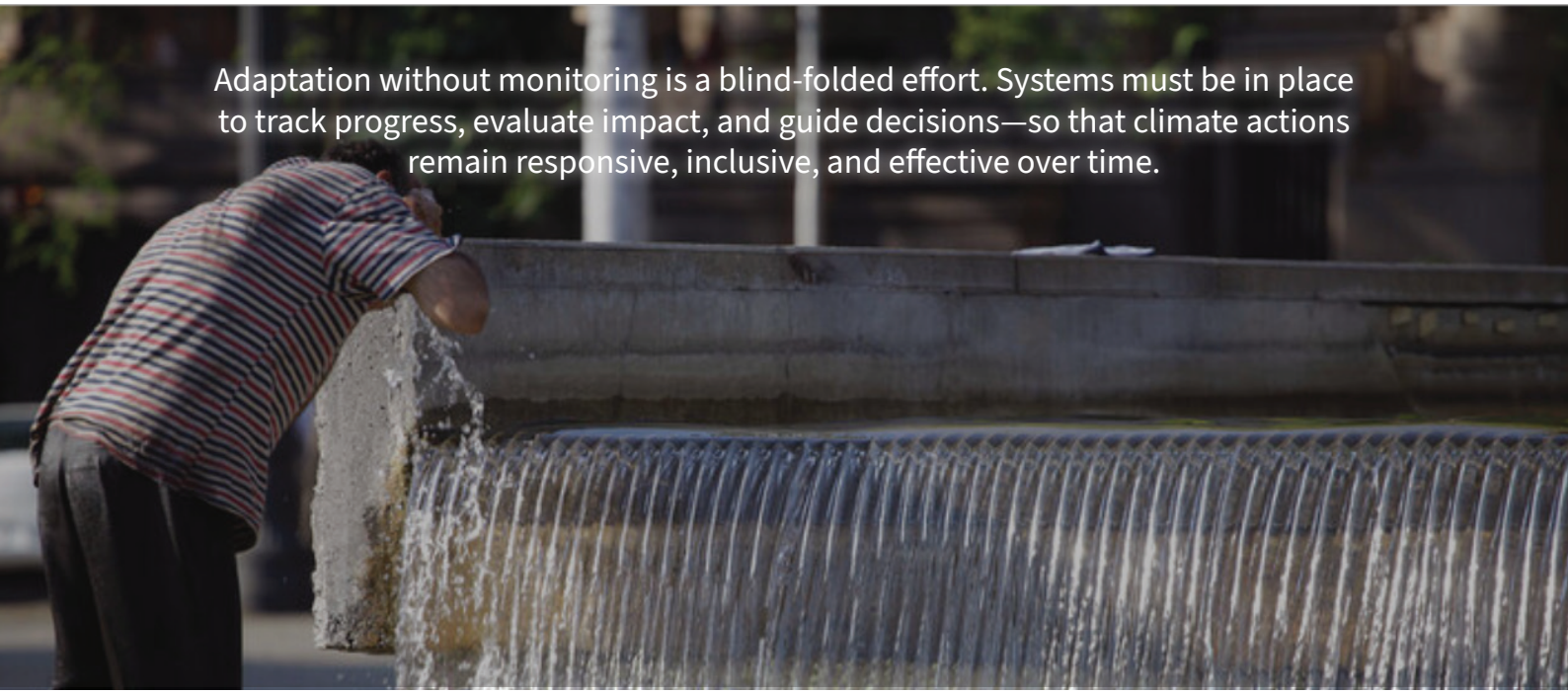
In Paraguay, the law provides for the collection of a fee for water use permits and concessions. The SAI audit found that this mechanism is not yet operational and that weaknesses persist in the updating and coverage of hydrological information systems. This limits evidence-based decision-making, which is essential for effective monitoring of adaptation.

The Marshall Islands faces significant challenges in financing adaptation measures and accessing international climate funds. Seawall construction has been reactive and uneven, leaving critical areas, such as flood-prone airport roads, unprotected, while less vulnerable zones received barriers. The audit recommended that the government scale up efforts to secure climate financing for implementing adaptation measures. This includes the Ministry of Finance prioritising the strengthening of its institutional and operational capacity to meet donor requirements and receive the funds.

Tanzania faces challenges, including insufficient climate adaptation financing and non-compliance with budgetary guidelines, due to limited local government budgets and ineffective financing mechanisms. This dependency on uncertain funding exposes adaptation efforts to vulnerabilities, with declining development assistance grants and loans.

2.7. Measuring Progress and Impact | Monitoring & Evaluation

- Strengthening Climate Adaptation through Inclusive Monitoring: Cuba's Water Sector



Cuba's National Institute of Hydraulic Resources (INRH) has made substantial progress in monitoring the implementation of climate adaptation actions in the water sector through the Sistema de Gestión de Información del Agua (SGIA), which enables real-time tracking of water stress and reservoir levels to support decision-making and policy alignment with SDG 6 and national climate goals. However, the system's full potential is not yet realised, as key indicators—particularly those related to innovation and governance—are not yet processed in SGIA due to limited user training and a lack of procedural clarity, leading to parallel manual tracking and reduced efficiency. Importantly, citizen participation plays a vital role in outcome monitoring, as trained community members measure rainfall and contribute to local data collection, thereby enhancing the granularity and relevance of hydrological assessments. Strengthening SGIA's integration, expanding training, and formalising citizen-led monitoring can significantly improve the evaluation of adaptation outcomes and ensure inclusive, evidence-based water governance.

- Why are monitoring and evaluation important for adaptation?

Monitoring and evaluating national climate change adaptation efforts can (1) help auditors, leaders, and the public evaluate what has been achieved by government expenditures, (2) improve the transparency of programmes, and (3) encourage learning and evidence-based decision making, among other benefits. However, every CCAA audit cited the need to develop or improve monitoring and evaluation (M&E) systems for climate change adaptation actions, regardless of the type of adaptation action. These audits collectively highlighted a range of common challenges and opportunities for improving the monitoring and evaluation (M&E) of adaptation actions.

Challenges

- **Timing Mismatch.** Effective adaptation efforts won't be evident for decades, in many cases. The benefits of current government investments in adaptation occur well into the future and require comparison against an unknowable "counterfactual" baseline, or an alternative reality that didn't happen. Thus, it is challenging to monitor and evaluate the potential damages avoided due to government adaptation investments. However, national government decision-makers require precisely this type of metric to make adaptation investments in the first place.

- **No Standard.** M&E systems are context-dependent because each country has different climate risks, goals, and adaptation plans. There is no "standard."
- **Downstream.** M&E systems are dependent on well-functioning and integrated (1) Risk Assessment, (2) Planning, (3) Implementation, (4) Roles and Responsibilities and Coordination, (5) Climate Finance and Resources, and (6) Citizen Participation. Weaknesses in these "upstream" steps make it more difficult for "downstream" M&E efforts. Every audit in the CCAA illustrated challenges with the six upstream steps.
- **Limited Data Systems.** Centralised data platforms are either non-existent or not tailored to adaptation, and data fragmentation and a lack of verification methods hinder monitoring and evaluation.

Opportunities

- **Start with Process-Based Metrics.** Because of the timing mismatch, it is very hard to develop "outcome" metrics that evaluate risk reduction or avoided damages from climate change adaptation investments. Thus, it is important to start with "process" metrics, or those that focus more on counting completion of administrative steps, like completion of elements of an adaptation plan, number of adaptation projects implemented, etc. Outcome metrics can be developed over time, tailored to the specifics of each country's efforts.
- **Do Not Wait for Perfect.** Nobody, including academic researchers, knows how to conduct monitoring and evaluation (M&E) for climate change adaptation. Auditors and national governments can't wait to develop the perfect set of M&E metrics and need to learn by doing. This creates opportunities to get creative, try out some trial metrics, and adapt them over time as new facts emerge. Establishing a central repository for adaptation actions, lessons learned/and success stories would help save time and avoid duplication of effort.
- **Conduct Regular Audits.** Auditors can help develop M&E frameworks by conducting regular audits that identify areas for improvement in indicators, baselines, and targets.

- Audit Perspectives on Impact Measurement

In the Federated States of Micronesia, the national government currently lacks a robust monitoring and reporting mechanism for climate change adaptation activities. There are national laws and policies in place on climate change adaptation; however, the implementation of these laws and policies is not being centrally monitored and evaluated to ensure compliance. There is also no existing platform for reporting the implementation of national and state plans established for climate change adaptation planning or actions.

Ireland's National Adaptation Framework identified the need for the development of appropriate national, sectoral, and local-level climate change adaptation indicators to enable the monitoring and evaluation of progress on adaptation. The flood risk management sectoral adaptation plan identified five interim indicators related to flood risk management in 2019. However, the audit found that a set of national adaptation indicators had still not been defined by 2024. The audit report recommended the development of process-based indicators that would allow for meaningful monitoring of progress on climate change adaptation and ensure that defined climate change adaptation actions are being implemented.

The water resources management-focused audit in Brazil evaluated the country's National Plan for the Recovery of Hydroelectric Reservoirs. This plan aims to restore hydroelectric reservoirs and optimise water resources use, which aligns with Brazil's adaptation needs in the face of extreme climate events. The audit found that a defined monitoring and evaluation framework was in place for implementing the plan. However, the audit identified limitations in public engagement and transparency during the implementation of the monitoring.

In Saint Kitts & Nevis, the audits found that there is currently no established system in place to measure and evaluate the progress and impact of the country's climate change adaptation efforts. Although the audits acknowledged a persistent lack of measurement and evaluation frameworks to understand the efficacy of such efforts. Despite these limitations, according to the audit of Water Resource Management on the island of Nevis, the Water Department plays a crucial role in monitoring water stability on the island, which serves as a vital indicator of the overall reliability and consistency of water resources available to the community.

Uganda significantly expanded its water monitoring network to 243 stations, with 56 equipped for real-time telemetry. However, nearly half of these stations are non-functional due to vandalism, poor maintenance, and underfunding. Manual data collection is often inconsistent, as underpaid or informal observers frequently perform it. Supervisory visits are infrequent, and data quality suffers from gaps and inaccuracies. The audit highlights the urgent need to professionalise data collection, rehabilitate infrastructure, and integrate geospatial and automated tools to strengthen climate adaptation monitoring.

Vietnam has developed a National Adaptation Plan (NAP) and a national Monitoring and Evaluation (M&E) system, but technical and institutional challenges have hindered its implementation. The online M&E reporting software remains inactive due to a lack of cybersecurity certification, preventing agencies from submitting progress reports.

Vanuatu's Water Information Management System (WIMS) is outdated and has been compromised by a cyberattack, severely impacting its ability to monitor climate risks. The system lacks predictive analytics, structured reporting, and up-to-date inventories, which limits its usefulness for informed decision-making.

Indonesia's Vulnerability Index Data Information System (SIDIK) lacks geospatial integration and remains dependent mainly on tabular data, which limits its accuracy. The audit identified inconsistencies in success criteria across agencies and noted a lack of coordination in the development of the National Adaptation Plan. Reforestation efforts suffer from poor monitoring and unclear responsibilities between central and localgovernments. To improve M&E, Indonesia must harmonise indicators, incorporate spatial tools into vulnerability mapping, and align national and subnational adaptation priorities for coherent tracking and evaluation.

Tanzania's Vice President's Office (VPO) did not adequately undertake the monitoring and evaluation of the implementation of climate change adaptation actions. This was evident from the fact that the M&E indicators set were not fully integrated into the VPO's routine monitoring and evaluation (M&E) systems. The VPO's annual action plans for 2021/22, 2022/23, and 2023/24 did not fully incorporate any of the climate change adaptation indicators and targets from its Medium-Term Strategic Plan (2021/22–2025/26).

3. Auditors' Reflections on Climate Adaptation Audits

In addition to analysing individual audit reports, a post-audit survey was sent to the participants after they had completed the audit. A total of 38 answers were received.

Regarding the status of adaptation across countries, only 13% of the SAIs stated that there has been significant progress, whereas 24% noted major challenges in national adaptation policies. The large majority of SAIs (63%) noted areas needing improvement.

The survey also inquired whether the audits revealed anything unexpected. As many as 26 of 38 auditors stated that the audit revealed something unexpected, compared to the state of affairs as anticipated. Among the more constructive findings, auditors noted the availability of extensive climate-related information, the existence of a national platform for climate transparency, and the presence of structured national or sectoral adaptation plans. Auditors also observed that in some cases, auditees were cooperative and receptive to audit recommendations, and relevant data were accessible.

Conversely, several audits encountered limitations, including restricted access to necessary information, communication challenges with auditees, and the absence of critical data. The survey highlighted that incomplete or entirely missing data posed greater obstacles than data that was merely unreliable or inaccurate. Specific climate-related deficiencies included inadequate risk assessments, the absence of a national adaptation plan, inactive coordination bodies, and insufficient monitoring mechanisms. Additional concerns were raised regarding slow implementation, bureaucratic delays, weak inter-ministerial coordination, and unclear financial classifications, particularly in relation to donor funding. Classification of financial information was also found to be missing.

> *"There are a few, but one of the biggest surprises was that the Ministry of Tourism and Environment doesn't have accurate data regarding the amount of money allocated for projects on adaptation to climate change."*

Key challenges identified by SAIs included the inability to get needed data and the lack of documentation. This is also related to the often-mentioned issue with monitoring, evaluation and reporting. Coordination gaps, funding constraints, and a disconnect between policy objectives and implementation were also frequently cited. In one instance, auditors noted a lack of understanding of adaptation concepts among officials. The gap between policy ambition and on-the-ground implementation was also mentioned.

> *"What cannot be measured - cannot be monitored. The most concerning aspect of the audit findings was the lack of accountability for the planned adaptation actions in the National Adaptation Plan. This was due to the absence of critical systems and processes, such as measurement systems, recording, verification, and reporting requirements. Therefore, tracking the progress of implementing the planned adaptation actions in the National Adaptation Plan was not possible".*

Despite these challenges, several SAIs reported that audit findings were acknowledged by auditees and contributed to the development of corrective actions. The existence of national adaptation strategies or plans was viewed as a foundational element for future implementation. Effective collaboration with stakeholders, donors, and international organisations was also noted as a facilitating factor. Good planning is a precondition for successful implementation.

> *"There is a National Adaptation Plan on Climate Change, which is well designed. All we have to do is implement it and seek other funds."*

As the above analysis shows, the lack of data is a problem for the adaptation policy, but auditors work alike. According to the survey, incomplete and missing data are larger problems than unreliability and inaccuracy of data.

4. The Way Forward

As the climate crisis intensifies, economic risks and fiscal pressures escalate—making adaptation not only necessary but also urgent. Performance audits from over 50 Supreme Audit Institutions (SAIs) show that effective adaptation is achievable and transformative when supported by the right enablers.

It starts with knowledge. Centralised, science-based climate data acts as a compass, guiding governments to anticipate risks rather than react to them. Yet data alone isn't enough—progress accelerates when adaptation is embedded in national planning and budgeting.

Inclusiveness is essential. Vulnerable communities offer vital insights, ensuring solutions are just and grounded in lived experience.

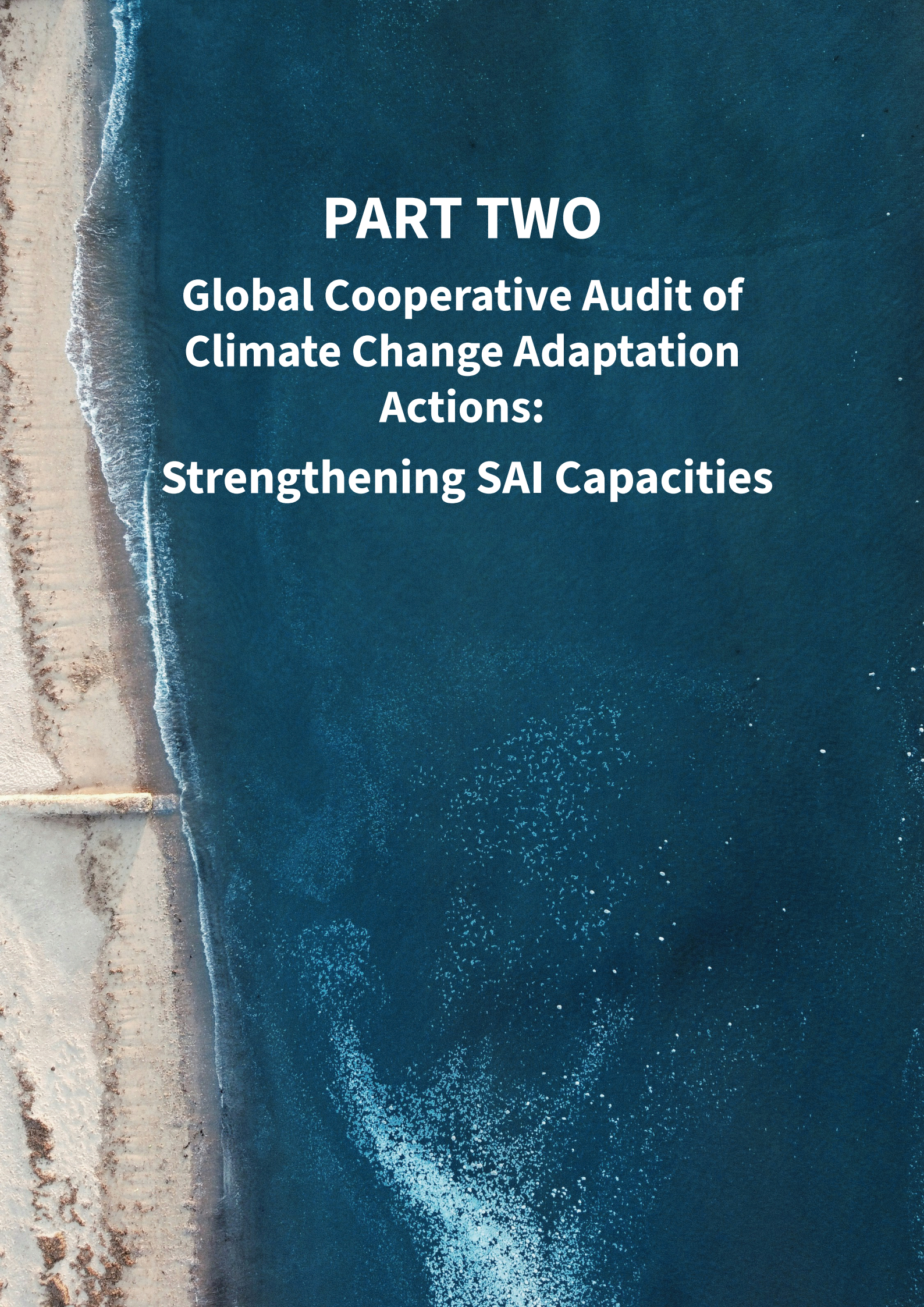
Finance is evolving. Good practices—such as climate finance units, budget tagging, and multi-source funding—are helping countries coordinate their efforts and access resources. Transparency and accountability are essential to establishing a robust financial foundation.

Coordination drives success. When roles are clear and ministries collaborate, adaptation becomes a shared mission. Intersectoral commissions, updated risk assessments, and robust monitoring systems are technical tools—but they are also acts of leadership.

Challenges remain. Fragmented institutions, financing gaps, and weak monitoring. But these are calls to action, not roadblocks. Adaptation is a continuous, evolving commitment.

The path forward is inclusive, data-driven, and integrated – all within an effective governance model. SAIs are vital allies—bringing oversight, accountability, and transparency. By working with SAIs, governments can build trust and ensure every euro, dollar, or peso spent delivers lasting impact.

Together, we can turn climate resilience from aspiration into action.



PART TWO

Global Cooperative Audit of Climate Change Adaptation Actions:

Strengthening SAI Capacities

1. SAIs demonstrated value by enhancing their capacities to audit Climate Change Adaptation Actions

As climate change intensifies, it presents governments with complex challenges and exposes vulnerable populations to new risks. Effective government response requires both robust action and reliable monitoring. Supreme Audit Institutions (SAIs) are uniquely positioned to strengthen governance, enhance effectiveness, and promote inclusivity in government climate change adaptation measures.

To support SAIs in delivering relevant audit responses to climate change, the INTOSAI Development Initiative (IDI) and the INTOSAI Working Group for Environmental Audit (INTOSAI WGEA) facilitated the global cooperative audit of climate change adaptation actions (CCAA). The initiative was designed to enhance both an SAI's contributions to effective and inclusive climate adaptation and SAI capacities to conduct high-quality and high-impact audits in this area on a regular basis.

Envisioned outcomes of the CCAA audits

SAI audits contribute to improved governance, effectiveness, and inclusivity of government's climate change adaptation actions.

SAIs enhanced capacities to conduct high quality and high impact audits of climate change adaptation actions

2. CCAA created opportunities for SAIs to respond to climate adaptation

Participating SAIs viewed the CCAA audit as an opportunity to deepen their knowledge of national strategic priorities while advancing institutional learning. Many were motivated by the need to develop foundational knowledge, strengthen capacity in adaptation auditing, and respond to evolving national climate policies.

> *"The CCAA audit on sea level rise and coastal erosion has the potential to strengthen the transparency and effectiveness of national climate policies (such as Colombia›s 2017 Coastal Erosion Master Plan, the subject of this audit), by identifying critical gaps such as limited budget allocations and a lack of inter-institutional coordination, allowing for prioritizing actions in vulnerable areas with projected losses of 49,000 coastal hectares."*
>
> *SAI Colombia Audit Team*

SAIs from fragile and climate-vulnerable contexts emphasised the urgency of addressing risks directly affecting their populations. The CCAA audit was the first formal engagement with climate adaptation as an audit theme for several SAIs—a critical step in building expertise, refining performance audit methodologies, and strengthening climate competence within their teams. Others saw the audit as a way to increase visibility of the challenges climate change poses in their countries.

The growing urgency of environmental threats in small islands and highly vulnerable states further encouraged participation. SAIs in these countries focused on pressing issues such as water resource management, sea-level rise, and coastal erosion. For many SAIs, the CCAA audit also provided a valuable platform to learn best practices on climate change adaptation related to their topic of interest, and collaborate with peers, while contributing to global insights on climate change adaptation efforts.

CCAA audit helped many SAIs in fragile and climate-vulnerable contexts to conduct climate change adaptation audits for the first time.

3. SAIs enhanced institutional, organisational and professional staff capacities to conduct high-quality audits of climate adaptation

IDI and WGEA supported SAIs through professional education, mentoring, and tailored audit support — elements that participating SAIs recognised as critical to the quality and impact of their audits. They credited the initiative's professional education, mentoring support, and audit templates with shaping audit planning, conducting, reporting, and overall quality management.

The CCAA's professional education sessions enabled SAIs to define audit scope, strengthen causal analysis, and apply internationally recognised standards. Peer review and mentoring activities provided opportunities for SAIs to reflect on existing practices, deepening their understanding of stakeholder perspectives and expectations.

Several SAIs highlighted the value of the CCAA audit in providing targeted knowledge on specific audit topics. The CCAA provided audit templates, which many SAIs found to be more structured and efficient, while others enhanced their use of various audit tools in the context of climate adaptation. For some, the audit experience also introduced refreshed approaches to cross-government coordination, coherence assessment and performance measurement.

The IDI-WGEA resource team support contributed to audit quality, highlighting the importance of professional education, audit tools, mentoring and peer-learning platforms.

The guidance provided by IDI and WGEA through CCAA audit helped SAI teams navigate complex audit questions, particularly those related to the technical aspects of climate change adaptation.

"Participating in the CCAA audit was such an excellent experience for the entire team. We found the concise and comprehensive training provided at each phase of the audit to be particularly useful, as it enabled members of our staff with limited experience in the area to participate successfully in the audit."

SAI Cyprus Audit Team

Participating SAIs took deliberate steps to ensure their audits complied with applicable performance audit standards. They relied on SAI performance audit manuals, ISSAI-based standards, and multi-level quality reviews meant for safeguarding consistency and credibility. For smaller SAIs and those operating in fragile contexts, IDI tools proved especially critical in maintaining audit quality.

SAIs reported marked improvements in auditing skills, stakeholder engagement, and strategic thinking on climate issues. The process also catalysed internal discussions on audit planning, policy influence, and long-term institutional preparedness. Many SAIs underscored how the experience helped embed climate risk considerations into their broader audit agendas and institutional strategies, thus strengthening their role in supporting national responses to climate change.

"Participating in the cooperative audit on climate change adaptation organised by IDI-WGEA has been a truly valuable experience for our SAI. The mentors were highly knowledgeable and supportive, offering practical guidance that helped us navigate complex audit topics and strengthen our work. This initiative has not only enhanced our technical capacity but also built lasting connections among SAIs committed to addressing climate resilience."

SAI Indonesia Audit Team

4. SAIs navigated challenges to deliver value

SAIs experienced challenges in conducting audits, including technical complexity, limited or fragmented information, weak stakeholder coordination, the cross-cutting nature of policies, and political or security constraints.

To address many of these challenges, SAIs combined mentoring, flexible scoping, structured methodologies, and adaptive learning. In some cases, SAI leadership was directly engaged to provide additional support.

SAIs addressed technical complexity through self-study, utilising CCAA training modules, and leveraging peer feedback to refine their methodologies.

Effective climate audits require strong inter-agency cooperation and flexible audit tools to manage complex and evolving risks.

Data gaps and poor inter-agency coordination were mitigated through follow-ups, strengthened stakeholder engagement, and triangulation of evidence with external sources. Some SAIs also effectively utilised open data, partial inputs, and adapted audit scopes to address information limitations. Across contexts, the combination of professional education, mentoring, and cross-institutional collaboration proved pivotal in helping SAIs maintain audit quality.

5. Call for strengthened multi-stakeholder engagement for greater impact

For SAI reports to gain traction and achieve societal impact, stakeholder engagement was essential. Through the CCAA audit, most SAIs focused primarily on dialogue with audited entities such as environment ministries, national climate offices, and sectoral agencies in agriculture, water, or disaster management. Some mapped stakeholders systematically, while others had limited engagement with civil society, academia, or media.

SAIs acknowledged the importance of multi-stakeholder engagement, but most SAIs reported challenges in broad-based stakeholder engagement.

"The small Island Developing State (SIDS) stands at the forefront of the climate crisis, where the consequences of global inaction are not distant projections but daily realities. Our survival depends on the health of our reefs, the stability of our coasts, and the resilience of our communities. Within this context, the role of Supreme Audit Institutions (SAIs) is particularly significant. Ensuring value for money and accountability in the use of limited public resources is essential to strengthening national resilience and advancing climate adaptation efforts. Through our contribution to the global resource team of the CCAA programme, SAI Maldives has worked to amplify the unique vulnerabilities and perspectives of SIDS. We believe that by strengthening climate accountability and building capacity across SAIs, especially in the most affected regions, we can collectively drive the global momentum needed to safeguard our planet for future generations."

Mr Hussain Niyazy, Auditor General of the Maldives

One notable best practice came from SAI staff who met directly with community members during site visits, validating audit evidence through lived experiences and helping to resolve disputes with auditees.

While many participants acknowledged that broader engagement beyond the public sector could have strengthened their audits, challenges in identifying relevant stakeholders often limited their outreach. As a result, structured interviews, questionnaires, and workshops were the most used tools for gathering evidence.

"We are facing a crucial moment in which we must highlight the leading role of SAIs in the face of the global challenge of adapting to climate change. In this context, the joint effort of high technical and scientific quality that the Global Cooperative Audit of Climate Change Adaptation Actions (CCAA) stands for is a compelling example of collaboration and positive impact for our communities."

Camilo Benítez Aldana, Auditor General of the Republic of Paraguay, Chair of OLACEFS and Head of OLACEFS Technical Commission on the Environment (COMTEMA)

6. Lessons Learned for Improving Future Climate Change Audits

SAIs provided practical recommendations to strengthen future climate audit work. They highlighted the need for more tailored sample questions, stronger implementation support, advanced education modules, and capacity building in areas such as digital auditing and participatory or citizen-driven approaches.

SAIs need more context-specific audit tools and methods, especially for emerging areas like IT/digital and climate finance audits.

"Participation in the CCAA Cooperative audit established an excellent foundation to enable the team to deliver a high-quality audit. As the Court of Auditors stated at the beginning of our interaction, it's important to continue carrying out cooperative audits, allowing, on the one hand, to provide a contribution to a global overview of the issues involved and, on the other, to access information on international best practices."

SAI Portugal Audit Team

SAIs also emphasised the importance of improving systems to track implementation of audit recommendations and underscored the need to reinforce SAI independence when addressing politically sensitive issues.

7. Looking ahead: Emerging climate audit priorities for SAIs

SAIs expressed a strong appetite to expand their climate audit portfolios into diverse and increasingly urgent areas. Their priorities included climate finance, mitigation, sectoral audits (e.g., health, biodiversity, infrastructure), and cross-thematic assessments. Many SAIs were particularly eager to examine how public funding aligns with national climate priorities.

"We decided to join the CCAA project to tackle an important theme in our country – flooding. It was an opportunity to acquire new knowledge and experience, and to exchange good practices with other institutions. Working with IDI-WGEA provided training sessions that were especially valuable for some of the new auditors in our office. The extensive materials and key highlights saved us a significant amount of work during the audit scope study phase, making it easier for the audit team to plan the audit. In addition, we received useful and constructive feedback and guidance from both mentors during the planning and reporting phases of our work."

SAI Slovenia Audit Team

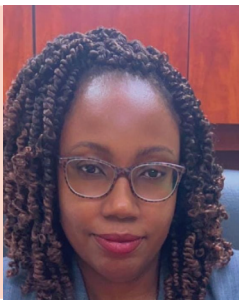
Climate finance emerged as a top priority. SAIs emphasised the need to track fund flows, assess budget alignment, and strengthen donor accountability. Others expressed interest in auditing mitigation and resilience efforts, including clean energy, urban adaptation, and emissions reduction.

Sectoral priorities that SAIs identified include:

- Ecosystem protection and biodiversity
- Risk assessment tools
- Infrastructure resilience
- Economic resilience and energy transition
- Mitigation and deforestation
- Agriculture and irrigation
- Adaptation in urban and rural areas
- Marine-based adaptation
- Social and health impacts of climate change

"As the Head of SAI St. Kitts and Nevis, I have seen growth in the persons involved in the audit. I also think that the fact that this audit was conducted simultaneously with the ClimateScanner assessment allowed the auditors to leverage the knowledge gained and take a holistic view of what our government has been doing in relation to Climate Change. In terms of benefits and lessons learned, the audit teams stated that they are now more knowledgeable about Climate Change, and it has impressed upon them the need to hold governments truly accountable."

Ms Carla Pike, SAI St Kitts and Nevis



To address these complex topics, SAIs stressed the importance of continued support from IDI and WGEA—particularly in the form of guidance materials, benchmarks, and advanced training.

With adequate recognition and impact, SAIs expect that CCAA audits will trigger institutional reforms, strengthen tracking systems, enhance coordination, and influence both national adaptation strategies and broader climate governance. Many also see that their findings contribute to global assessment frameworks such as the UNFCCC and Climate Scanner, as well as informing parliamentary debates and raising national awareness.

Climate adaptation audits have the potential to directly shape governance, funding, and policy—but only if findings are followed up and acted upon.

"The CCAA audit was a valuable opportunity to apply the ISSAI-based performance audit methodology in practice and to assess how national systems operate in addressing climate change adaptation and disaster risk reduction. The audit confirmed both strengths and gaps in coordination, planning, and early warning systems, while also providing practical recommendations to improve institutional capacity and resilience. Participation in this cooperative audit enabled us not only to assess national progress but also to further develop the professional expertise and institutional capacities of our audit team, thereby reinforcing accountability in the field of climate change adaptation."

SAI Ukraine Audit Team

Some SAIs reported that their audits highlighted critical needs for national monitoring systems, water resource management, and climate governance.

To sustain the CCAA's momentum, SAIs may consider conducting follow-up audits at an appropriate time, providing staff with mentoring, establishing internal working groups, and integrating CCAA audit tools into regular performance audit practices. However, smaller SAIs remain at risk of capacity loss without ongoing external support.

"The cooperative audit on climate change adaptation led by the INTOSAI Development Initiative has had a positive impact on auditors by enhancing their capacity to address environmental issues. Through shared methodologies, training, and international collaboration, auditors have gained valuable knowledge and skills to assess government responses to climate change more effectively. This initiative has also promoted greater awareness among auditors of the importance of sustainable development, encouraging them to incorporate climate risks into their audit work."

SAI Vietnam Audit Team

SAIs have adopted forward-looking strategies to ensure the sustainability of knowledge and skills gained through the CCAA, including:

- embedding climate audits in annual audit plans;
- integrating CCAA audit tools and templates (e.g., root cause analysis) into audit practice and staff training;
- developing capacity development strategies to retain and expand expertise; and
- continuing environment-focused audits while sharing findings through regional cooperation.

These approaches reflect a shift from one-off audits toward sustained audit practice—one of the central objectives of the global cooperative audit initiative.

In conclusion, the CCAA audit has achieved its objective of supporting SAIs with diverse capacities to conduct high-quality and high-impact audits of climate change adaptation actions. This global audit has seen wide-ranging effects, including SAIs conducting their first audits of climate change adaptation, using mentoring, flexible scoping, structured methodologies, and adaptive learning to navigate complexity. While there is a need to strengthen broad-based stakeholder engagement, SAIs have demonstrated the will and commitment to provide robust external oversight on climate action.

The continued vision and commitment of SAI leadership, a strong coalition of stakeholders, and long-term support from partners will be crucial to sustaining the momentum and building on the gains of CCAA audits for the benefit of all.