SEMINAR SUMMARIES 1/2025

Auditing Our Blue Planet

INTOSAI WGEA 23rd Assembly – MALTA 2025

National Audit Office
MALTA

Contents

INTOSAI
Working Group
on Environmental
Auditing

Key messages

National Audit Office
MALTA

The triple planetary crisis—climate change, biodiversity loss, and pollution—poses severe threats to oceans and marine ecosystems. Despite their differences, countries around the Mediterranean share common environmental challenges, such as seawater warming and plastic pollution. This calls for regional cooperation, also among Supreme Audit Institutions (SAIs). SAIs can foster regional cooperation by, for example, engaging in collaborative audits.

The impacts of drought and desertification continue to intensify, especially in Africa and arid regions, and affect first women and girls, and poor communities, which are most exposed and vulnerable. Addressing the climate-water nexus, interdependence of land management, climate change and biodiversity require integrated and inclusive policy responses. The INTOSAI WGEA continues to support auditors' capacity to scrutinize nexus areas and a systems approach.

Open-access and integrated data systems can enhance innovation, coherent strategies, engage stakeholders, drive evidence-based decision-making and strengthen accountability. Geospatial data is particularly useful for environmental audits. Auditors can advocate for reliable, comparable, and accessible data, while INTOSAI WGEA can support auditors' data skills.

SAIs impact-oriented assessments and outcome-focused reporting help Parliaments to understand whether public funds are used effectively. Environmental audits should be recognized as strategic tools supporting governments in managing systemic environmental risks, building public trust and achieving long-term climate and sustainable development goals.

Climate-Resilient Water Governance: The Case of Malta

Karl Cilia, Chief Executive Officer, Water Services Corporation

Charles Deguara, Auditor General, SAI Malta

Miriam Dalli, Hon. Minister for the Environment, Energy and Public Cleansing, Malta

Sami Yläoutinen, Auditor General, SAI Finland

Moderator: Vivi Niemenmaa, Secretary General, INTOSAI WGEA

After the opening words of the Chair of the INTOSAI Working Group on Environmental Auditing (WGEA), Auditor General of Finland **Sami Yläoutinen**, and the host, Auditor General of Malta **Charles Deguara**, the Assembly commenced with reflections on Malta's environmental trajectory, highlighting the nation's strategic investments in water infrastructure and its vulnerability to climate-induced stressors. It framed Malta's water governance strategy as a practical and innovative response to the increasing environmental vulnerabilities posed by climate change, particularly in small island and water-scarce contexts.

Hon. Minister **Miriam Dalli** opened with a high-level policy perspective on the role of environmental audits in advancing good governance and sustainable development. She argued that environmental audits are instruments for institutional adaptation and improvement, not merely evaluative tools. According to Minister Dalli, Malta's commitment to environmental stewardship is evidenced by its transition from policy ambition to measurable outcomes. She cited, for example, the execution of 28 environmental audits conducted by the Water Services Corporation, which serve to ensure full accountability for public investments in the water sector. The Minister also highlighted the issuance of Malta's first sovereign Green Bond—one of the first in the global water utility sector—underscoring the nation's leadership in green finance and its capacity to mobilize capital for sustainability-aligned infrastructure.

Minister Dalli further described the application of artificial intelligence and real-time monitoring systems as pivotal in reducing pressure on groundwater resources, enhancing water quality, and improving system efficiency. She also referenced

The Minister of Environment, Energy and Public Cleansing, Miriam Dalli

Malta's investment in net-zero infrastructure, including the country's first carbon-neutral warehouse designed to enhance food system resilience in the face of climate change. Throughout her address, the Minister emphasized that science, policy, and community participation are the primary drivers of Malta's environmental transformation. In her view, transparency is not simply the act of releasing data, but the creation of governance systems where data drives decision-making, engages stakeholders, and strengthens accountability to present and future generations.

In the keynote address, Mr. **Karl Cilia** provided a comprehensive analysis of Malta's environmental trajectory, focusing on the strategic transformation of the country's water infrastructure. His presentation emphasized Malta's unique exposure to climate-induced hydrological stress and presented the national response as one rooted in integrated water management. Key elements of this approach include the deployment of desalination facilities, extensive wastewater treatment and reuse, and the integration of smart technologies for system-wide monitoring and optimization.

Mr. Cilia underscored that water infrastructure in Malta is no longer conceived solely as a technical asset but as a foundational element of national climate resilience. By embedding long-term financial planning, digital innovation, and performance monitoring, Malta has begun to transform water governance from a reactive service model into a proactive system of environmental risk management.

Delegates visiting wastewater treatment plant.

Environmental excursion to Malta's Water Treatment Plant (Ċumnija, Mellieħa)
During the 23rd WGEA Assembly, participants visited Malta's water treatment facility at Mellieħa. The plant carries out extensive wastewater treatment, where sewage water is cleaned and then pumped for reuse in agricultural irrigation. The excursion showcased Malta's technical approach to water reuse in a context of limited freshwater resources.

The Maltese experience presented at the Assembly illustrates how environmental auditing, technological innovation, and strategic financing can be harmonized to produce tangible advances in climate adaptation. Both speakers highlighted the evolving role of Audit Institutions in shaping sustainable public policy—not only through oversight but through constructive engagement that informs planning, strengthens institutional resilience, and builds public trust. The session concluded with a reaffirmation that environmental audits are increasingly becoming strategic instruments that support governments in managing systemic environmental risks, enhancing transparency, and achieving long-term climate and development goals.

Marine Environment: Global Pressures and Regional Governance

Robin Degron, Director of Plan Bleu, UNEP/Mediterranean Action Plan Sustainable Mediterranean region

Karina von Schuckmann, Senior Advisor, Mercator Ocean International (online)

William Peplow, Assistant Auditor General, SAI Malta

Akis Kikas, Director of Audit, SAI Cyprus

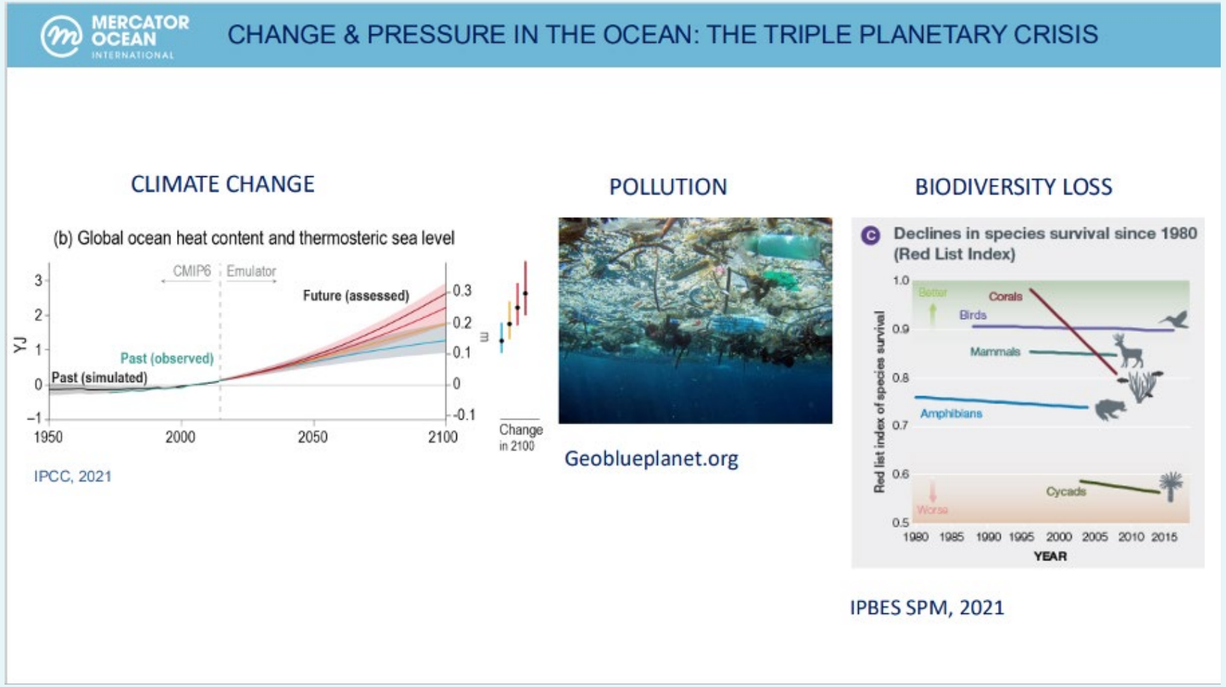
Moderator: Mohamed Ibrahim Jaleel, Director, SAI Maldives

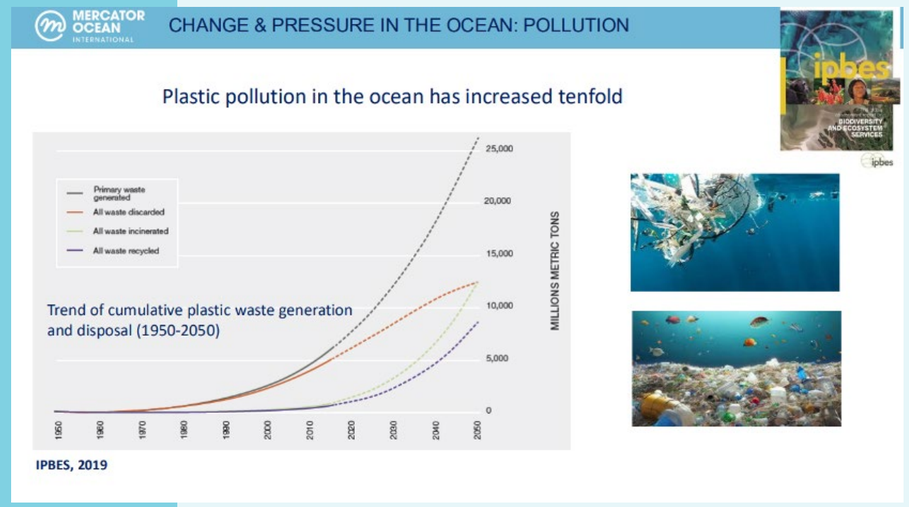
Karina von Schuckmann started by noting that all people on Earth rely on the ocean, either directly or indirectly, with nearly 28% of the global population living near the coasts and maintaining a deep connection with the ocean. The ocean is vital for sustaining life, regulating Earth's climate, and providing a multitude of services and resources for the livelihood of society. These include societal resilience, wellbeing, cultural identity, and economic growth.

She resented a comprehensive assessment of the global ocean's condition, emphasizing the interconnected impacts of climate change, pollution, and biodiversity loss—collectively referred to as the "triple planetary crisis."

Drawing on data from the Copernicus Marine Service and the Ocean State Report, she demonstrated that ocean warming is accelerating, with marine heatwaves increasing in frequency, intensity, and spatial extent. These changes are largely irreversible on human timescales and are already altering marine ecosystems and intensifying extreme weather events. Some changes could however be slowed, and others could be stopped by limiting warming. Any further delay in concerted global action will miss the brief, rapidly closing window to secure a livable future.

Water quality has fallen over the last five decades, with key environmental and societal impacts. Pollution, particularly from plastic waste and untreated wastewater, continues to degrade water quality. Over 80% of urban and industrial wastewater is discharged without adequate treatment, contributing to widespread contamination. Plastic pollution in the ocean has increased tenfold since 1950, with projections indicating continued growth despite regulatory efforts.



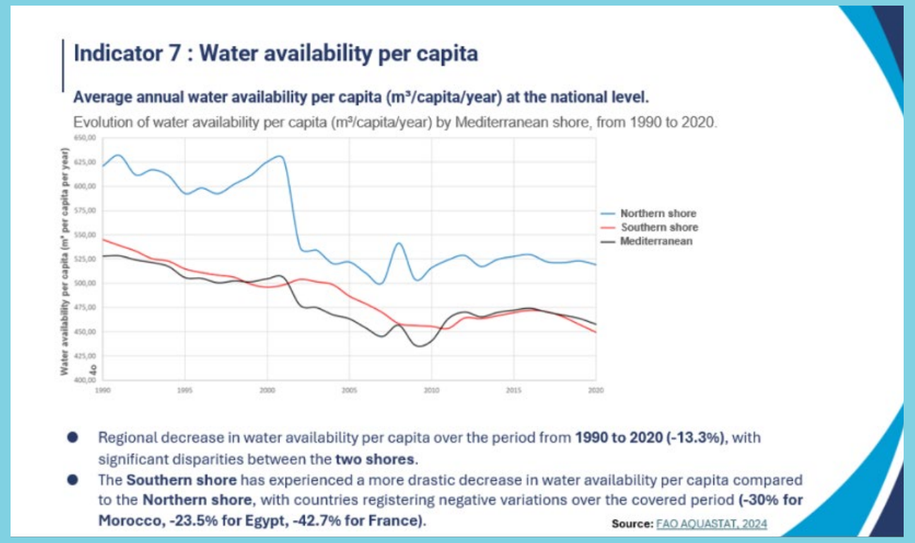


Biodiversity loss is also accelerating, with approximately 25% of assessed marine species threatened with extinction. The presentation underscored the urgent need for enhanced ocean monitoring and forecasting, highlighting Mercator Ocean International's role in supporting global ocean governance through open-access data services and capacity-building initiatives.

Karina von Schuckmann concluded by noting that "Now more than ever, there is an urgent need to monitor and report on the state, variability, and change of the ocean, as it faces mounting pressures from the triple planetary crisis and overexploitation—threatening both marine ecosystems and human well-being."

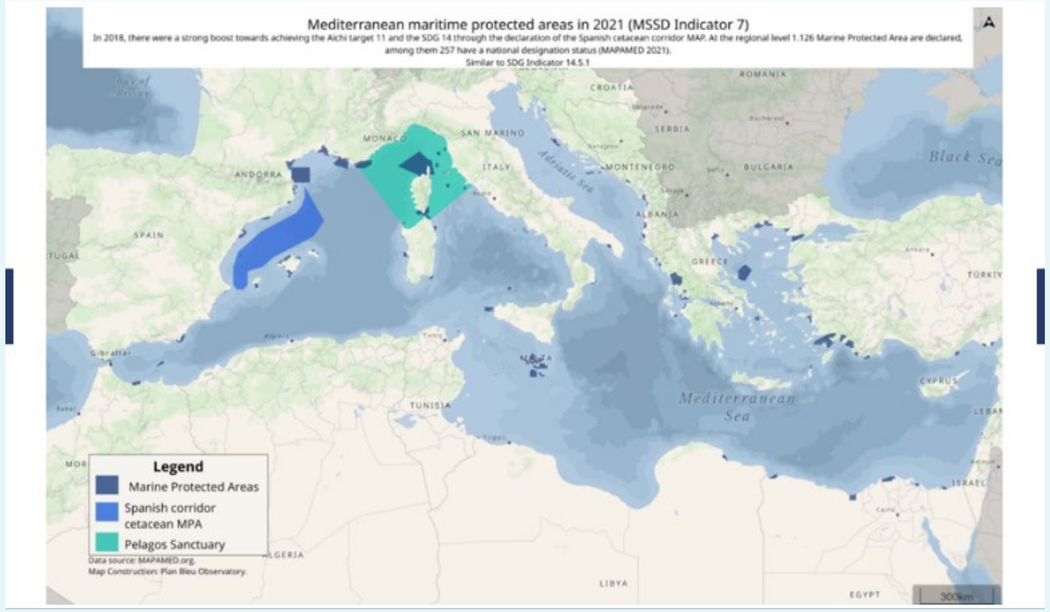
Dr. **Robin Degron's** presentation focused on the Mediterranean region, using indicators from the Mediterranean Strategy for Sustainable Development to illustrate significant environmental and socio-economic disparities between the northern and southern shores. Demographic trends show a younger population in the south and an aging population in the north, with implications for policy and resource allocation.

The warming climate has also led to rising temperatures in the Mediterranean Sea. Dr. Degron strikingly described the sea as turning into a "jacuzzi". Environmental indicators reveal a stark contrast in water availability, air quality, and plastic emissions. Water availability per capita has declined more sharply in southern countries, while air pollution levels (PM2.5) remain significantly higher in the south, particularly in Egypt. Marine plastic emissions continue to rise, with insufficient data collection and characterization hindering effective governance.



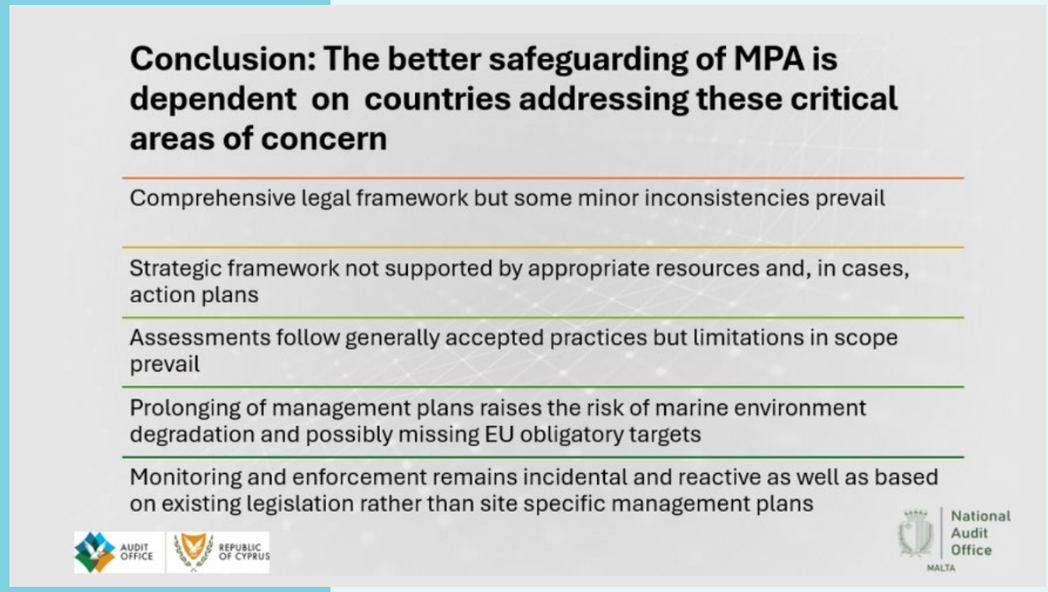
Despite a notable increase in the number of Marine Protected Areas (MPAs), coverage remains below international targets, and only a small fraction of MPAs benefit from high levels of protection. The presentation emphasized the need for improved regional cooperation and strategic planning to address these challenges and support sustainable development across the Mediterranean basin.

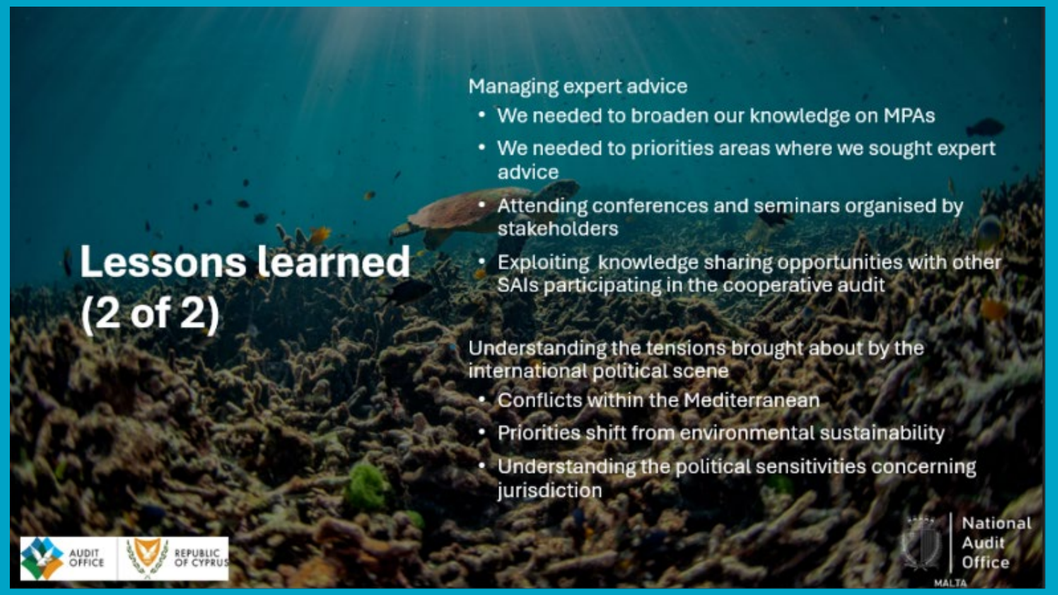
Representing a joint cooperative audit conducted by several Mediterranean SAIs, **William Peplow** (SAI Malta) and **Akis Kikas** (SAI Cyprus) examined the designation and management of marine protected areas (MPA). The main question of the cooperative audit was whether MPAs are appropriately safeguarded across Mediterranean countries.



The audit revealed that while legislative frameworks are generally in place, they are often fragmented and lack coherence. Many MPAs were designated under multiple legislative instruments, resulting in overlapping responsibilities and limited coordination.

Risk assessments used to justify MPA designation were found to be incomplete, with technical limitations and insufficient coverage. National strategies for MPA management were frequently fragmented, lacking specificity, measurable targets, and adequate resources for their implementation. Management plans were either absent or underdeveloped, and monitoring efforts were largely reactive rather than preventive/strategic.





The lessons learned from the cooperative audits were:

- Understanding the complexities of competing interests
- Managing the fragmentation of responsibilities
- Need to develop site-specific audit criteria, as one size does not fit all

Additional lessons learned were associated with the use of expert advice and the political tensions in the region.

Follow-up audits indicated partial progress. In Malta, strategic and operational recommendations were implemented to varying degrees, including improvements in administrative capacity and inter-agency coordination. Cyprus reported an expansion of its MPA network and strengthened monitoring through the procurement of services from the private sector, although key conservation targets and legally binding management measures remain pending.

Drinking water, droughts and desertification

Dr. **Animesh Kumar**, Head of Bonn Office, United Nations Office for Disaster Risk Reduction

President **Tarja Halonen**, Drylands' Ambassador for the UN Convention on Desertification (video)

Daisy Mukarakate, Regional Climate Policy Advisor, the Climate Change Strategies and Policy team of the UNDP Regional Service Centre for Africa (online)

James Pilly, Assistant Auditor General, SAI Tanzania

Xavier Leflaive, Senior Advisor, OECD Environment Directorate (video)

Moderator: Richard Pappoe, Technical Manager, AFROSAI-E

The second session explored the nexus between climate change, water scarcity, and land degradation. Presentations from global and regional experts highlighted the intensifying impacts of drought and desertification, particularly in Africa and arid regions. The climate-water nexus was framed as both a scientific, policy, and governance challenge, requiring integrated policy responses and robust institutional frameworks.

President **Tarja Halonen**, serving as UNCCD Drylands Ambassador, addressed the 23rd INTOSAI WGEA Assembly with a message emphasizing the urgent need for holistic approaches to environmental governance. She highlighted the interdependence of land management, climate change adaptation, and biodiversity conservation, stressing that healthy land is foundational to sustainable development and resilience.
A central theme of her address was the gendered dimension of environmental impacts. President Halonen underscored that women and girls are often the first and worst affected by environmental degradation, particularly in vulnerable regions such as drylands. She advocated for their empowerment as one of the most impactful strategies for achieving environmental and social sustainability.

The session also addressed the role of disaster risk reduction in building resilience. It was argued that auditing can serve as a tool not only for accountability but for strategic foresight, identifying vulnerabilities and guiding adaptive responses. The integration of climate risk into audit frameworks was presented as a necessary evolution in public sector oversight.

Daisy Mukarakate, Regional Climate Policy Advisor at UNDP, delivered a comprehensive presentation on the climate–water nexus in Africa, framing the continent's water crisis as a predominantly climate-induced emergency. Despite possessing 9% of the world's freshwater resources, Africa remains the second driest continent globally after Australia, with one in three Africans affected by water scarcity. The crisis is exacerbated by pollution, poor water governance, deforestation, limited water infrastructure, and conflict—all of which are intensified by climate change.

Her presentation detailed the historical and ongoing impacts of severe droughts across regions such as the Sahel, Horn of Africa, and Southern Africa, emphasizing their devastating social, economic, and environmental consequences. These include food and water insecurity, health crises, displacement, and gender-based vulnerabilities—particularly the disproportionate burden on women and girls.

Mukarakate outlined projected trends, including worsening droughts and reduced river flows, which threaten agriculture, hydropower, ecosystems and biodiversity. She emphasized the need for integrated, climate-resilient water governance and infrastructure, supported by strategic investments such as the Africa Water Investment Program (AIP), which aims to mobilize USD30 billion annually by 2030. She also referenced key policy platforms, including the Africa Climate Summit (2025) and the 3rd Pan-African Water Conference (PANAFCON-3), which are shaping post-2025 water strategies aligned with Agenda 2063. Her recommendations included

institutional reforms, innovative financing and investments, early warning systems, technology innovation and artificial intelligence, and the empowerment of women, girls, and Indigenous Peoples and Local Communities (IPLCs).

Senior Advisor **Xavier Leflaive** (OECD) explored the critical interlinkages between climate change and the hydrological cycle, emphasizing the urgent need for systemic water resilience strategies.

Leflaive highlighted how climate change is destabilizing the hydrological cycle. A 1°C rise in global temperature increases atmospheric water vapor by approximately 7%, intensifying precipitation variability and extreme weather events. Simultaneously, reduced soil moisture impairs carbon sequestration, creating feedback loops that exacerbate climate impacts.

The presentation underscored significant shifts in both green water (soil moisture and vapour in the air) and blue water (surface and groundwater). A global decline in total water storage has been documented in several parts of the world, threatening agricultural productivity and food security, ecosystem stability, and water security.

Key drivers affecting the hydrological cycle include climate change, mismanagement of water resources, and land use change. Leflaive emphasized the materiality of water risks, which directly affect ecosystems, economies (most industries, including financial institutions), and human health. These risks are now measurable, immediate, and systemic. One issue is equal access to hydrological data, as asymmetries between public and corporate institutions may impair policy design and regulation monitoring and enforcement. Disclosure of how activities affect the hydrological cycle and are exposed and vulnerable to its shifts has become a policy imperative, with benefits for environmental, economic and financial regulators.
Water must be recognized as a strategic resource, not merely a commodity. Leflaive advocated for a holistic valuation of water that incorporates environmental, social, and economic dimensions. This reframing is essential for effective governance and investment.

To address the growing water crisis, Leflaive proposed five missions, referring to the recent report of the Global Commission on the Economics of Water:

1. **Revolutionize food systems to reduce water demand and enhance sustainability.**

2. **Conserve and restore natural habitats to protect green water flows.**

3. **Establish a circular water economy to promote reuse and minimize waste.**

4. **Enable a clean energy and AI-driven future with lower water intensity.**

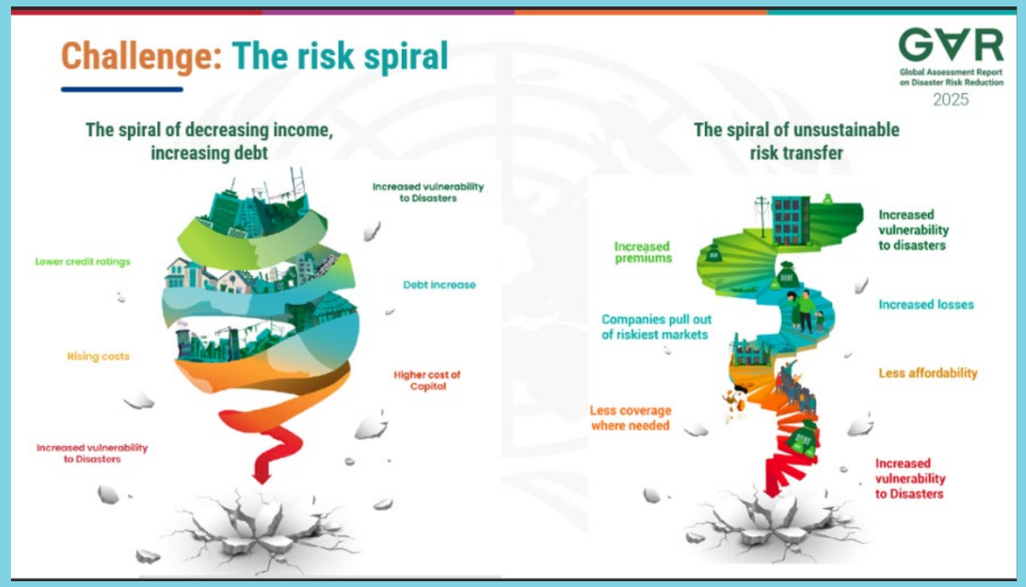
5. **Ensure no child dies from unsafe water by 2030, framing this as a global moral imperative.**

Leflaive called for mobilizing finance—public, private, and blended—to support these missions. Investment in water resilience is a foundation for long-term sustainability and global security.

The presentation concluded with a powerful message: a stable hydrological cycle must be a cornerstone of any climate strategy. Water resilience is both a scientific necessity and a moral obligation.

Dr. **Animesh Kumar** (UNDRR) highlighted in his presentation From Risk to Resilience: Leveraging Disaster Risk Reduction for National Auditing the urgent need to integrate disaster risk reduction (DRR) into national auditing frameworks. He began by situating the discussion within the context of global frameworks such as the Sendai Framework, the Paris Agreement, and the Sustainable Development Goals (SDGs), noting that progress toward these targets remains off track. Efforts are fragmented and lack coherence across sectors and institutions, undermining the effectiveness of resilience-building strategies.

While disaster-related mortality has declined by half since 2015, economic losses have surged to over USD 200 billion annually—ten times higher than a decade ago. More than 850,000 critical infrastructure units have been damaged or destroyed, and although early warning systems have improved, cascading economic impacts continue to pose significant challenges. Kumar described a "risk spiral" in which disasters reduce income and increase debt, while unsustainable risk transfer mechanisms deepen vulnerability. He emphasized that disaster and development risks often amplify one another, creating complex feedback loops.



A major obstacle to effective DRR is the lack of reliable and standardized data. Many countries are unable to assess climate and biodiversity losses linked to disasters. In response, UNDRR is developing a global methodology to address these gaps, including a hazard classification system encompassing over 300 disaster types to enable cross-country comparisons. Kumar stressed the importance of comparable data for informed decision-making and accountability.

The economic case for DRR is compelling: every dollar invested in DRR yields an average of $15 in avoided recovery costs, and every dollar spent on resilient infrastructure returns $4 in benefits. Despite this, DRR remains underprioritized in national budgets. Kumar called for stronger integration of DRR into national auditing practices, especially in light of

the December 2024 UN General Assembly resolution recognizing INTOSAI's role in climate change.

He outlined the roles of financial, performance, and compliance audits in supporting DRR. Financial audits can quantify disaster-related costs, performance audits assess the effectiveness of DRR and climate adaptation measures, and compliance audits ensure risk-informed planning in development. Kumar referenced key tools and guidance documents, including INTOSAI GUID 5330, the GAO Disaster Resilience Framework, and best practices from the Netherlands.

Finally, Kumar emphasized the importance of audit cooperation, capacity building for auditors, and alignment with international standards. He advocated for the systematic application of DRR principles in audit planning and execution, with findings reported back to the UN General Assembly and other intergovernmental bodies to strengthen global resilience and accountability.

James Pilly, Assistant Auditor General at SAI Tanzania and Secretary of AFROSAI WGEA, delivered a detailed presentation on desertification in Tanzania, reflecting on a recent performance audit of the National Action Programme (NAP) to Combat Desertification. Despite Tanzania's commitment to multilateral environmental agreements, including the UN Convention to Combat Desertification (UNCCD), the presentation highlighted significant challenges in managing land degradation and drought, which threaten food security, economic stability, and livelihoods.

He outlined the country's desertification status, emphasizing severe land degradation in regions such as Dodoma and Shinyanga, driven by factors like poor land management, deforestation, and climate change. The audit reviewed the government's efforts from 2015 to 2022, focusing on the Vice President's Office and various ministries responsible for implementing the NAP. Findings revealed weak coordination, inadequate monitoring and evaluation, and incomplete implementation of planned activities, with 67% of NAP initiatives remaining unfulfilled.

Pilly underscored the impacts of desertification, including livestock losses and decreasing crop yields, particularly maize. He recommended enhancing strategic planning, promoting inter-ministerial collaboration, developing integrated data systems, and establishing robust monitoring frameworks to improve accountability and program effectiveness. The presentation concluded that strengthening these areas is essential for achieving sustainable land management and combating desertification, thereby supporting Tanzania's environmental resilience and community well-being.

From Compliance to Impact: Evaluating Public Environmental Expenditure

Simon Upton,
Parliamentary Commissioner for the Environment, New Zealand

Commissioner **Simon Upton** presented the evolution of environmental accountability in New Zealand, focusing on the transition from compliance-based auditing to impact-oriented evaluation of public environmental expenditure. He outlined the limitations of current budgetary and reporting frameworks, proposed a methodology for whole-of-government expenditure estimation, and advocated for improved environmental data infrastructure to support evidence-based decision-making.

Environmental governance requires robust mechanisms for evaluating the effectiveness of public spending. In New Zealand, the Parliamentary Commissioner for the Environment (PCE) plays a unique role in scrutinizing environmental management systems and advising Parliament. The PCE operates independently, initiating investigations and providing policy advice aimed at improving environmental outcomes.

The PCE's mandate encompasses:

- Reviewing environmental management systems across central and local government.
- Investigating complex or neglected environmental issues.
- Supporting parliamentary scrutiny of legislation and expenditure.

Investigations prioritize topics either deemed too complex by decision-makers or insufficiently recognized in public discourse. Recent projects include assessing the ecological footprint of economic activity and exploring the use of emerging technologies to enhance environmental data accessibility.

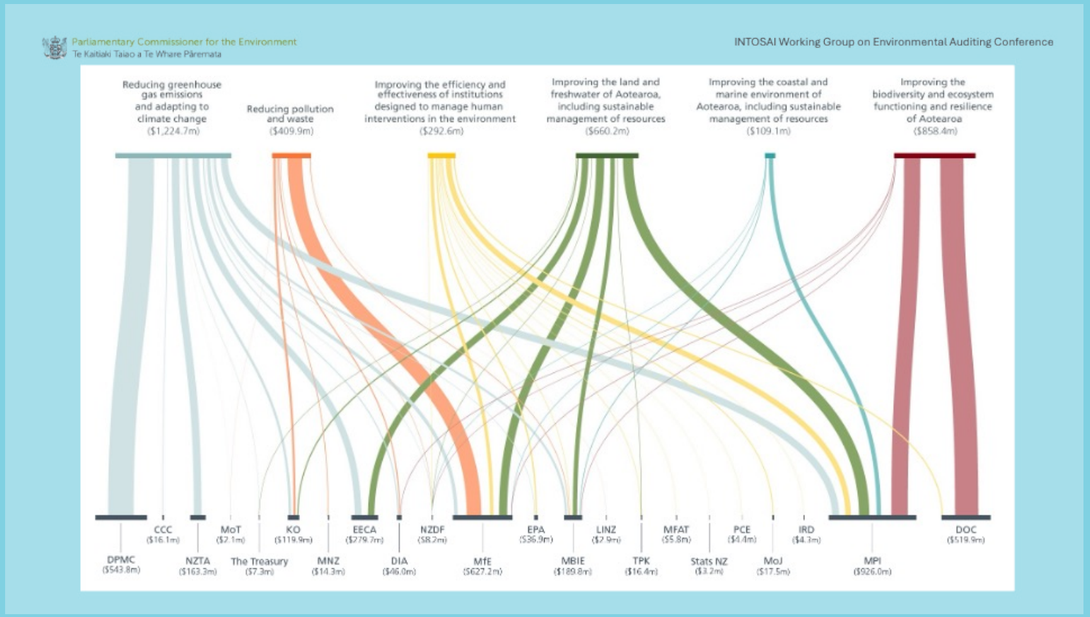
New Zealand's budgetary and performance reporting systems lack:

- A consistent set of environmental outcomes.
- Clear links between government strategies, expenditure, and environmental impact.
- Whole-of-government visibility across agency activities.

The focus on outputs rather than outcomes (e.g., hectares of pest control vs. biodiversity gains) obscures the effectiveness of environmental initiatives. This fragmentation undermines transparency and accountability, making it difficult for Parliament and the public to assess whether spending is achieving intended results.

To address these gaps, the PCE developed a methodology for estimating environmental expenditure across government. Key features include:

- Classification of spending using a hierarchy of enduring and specific outcomes.
- Alignment with international standards such as the System of Environmental-Economic Accounting (SEEA).
- Data collection from agencies with significant environmental responsibilities, focusing on material and significant expenditures.



In 2024/2025, the estimate revealed $3.6 billion in environmental spending, with climate adaptation surpassing mitigation for the first time—reflecting responses to extreme weather events.

Despite improvements, challenges persist:

- Subjectivity in classifying expenditure.
- Inconsistent granularity across agencies.
- Limited environmental data quality and accessibility.

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- Inconsistent granularity across agencies.
- Limited environmental data quality and accessibility.

The estimate is not intended to be precise but to provide a general sense of spending patterns and their alignment with outcomes. It complements existing accountability frameworks by offering a broader perspective on environmental investment.

Robust environmental data is essential for effective governance. New Zealand's fragmented data landscape hampers analysis and decision-making. The PCE recommends a federated data system—modeled on the country's integrated social data infrastructure—to unify disparate datasets while preserving agency autonomy. Geospatial data is proposed as the central organizing node for environmental information.

Evaluating environmental expenditure requires more than tracking dollars—it demands understanding outcomes. New Zealand's experience highlights the need for integrated reporting frameworks, consistent outcome definitions, and improved data systems. While the PCE's approach is one model, international collaboration is vital to advancing environmental accountability globally.

Commentaries:

Sami Yläoutinen, Auditor General, SAI Finland

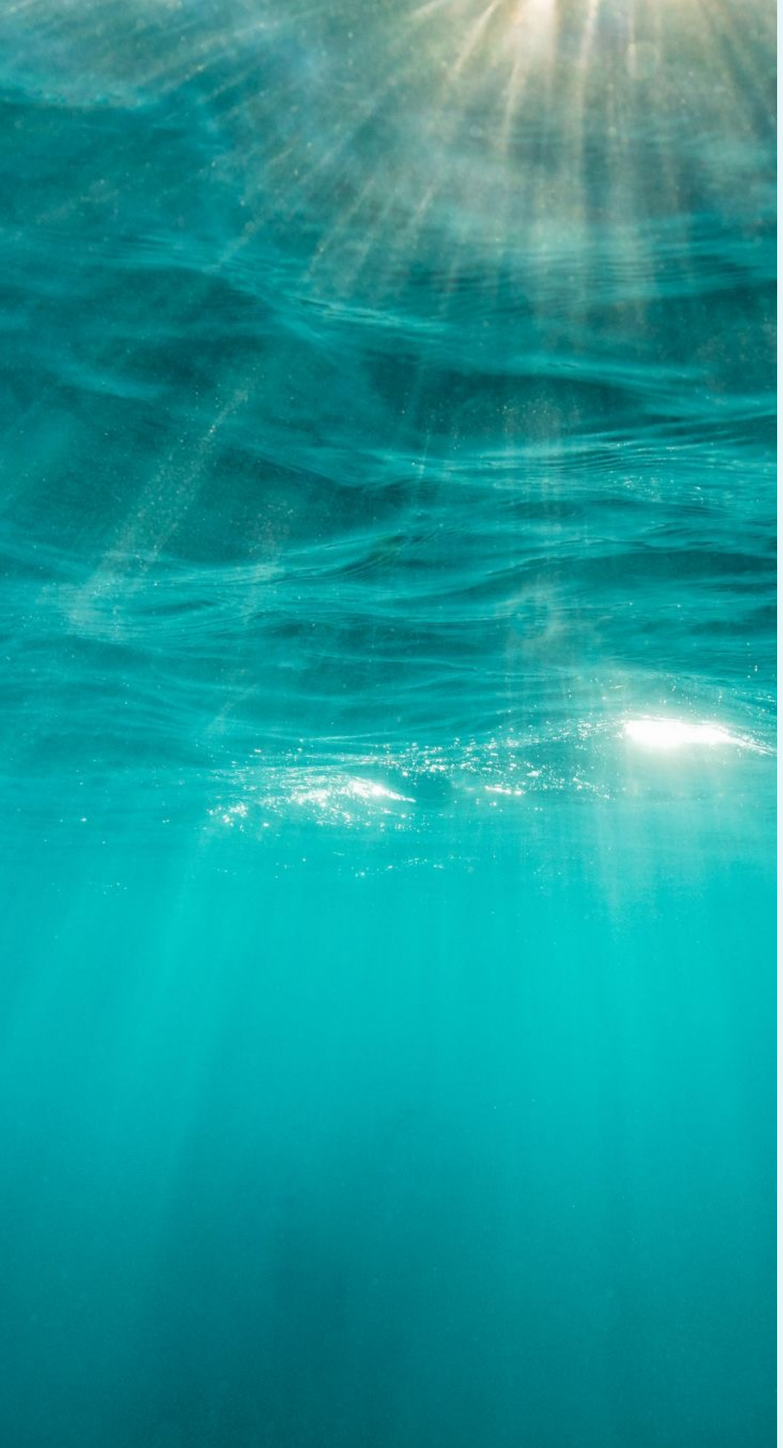
Ramona Bortnowschi, Principal Manager, European Court of Auditors

Hugo Freire, Head of the International Relations Department, SAI Brazil

Moderator: Raisa Ojala, Deputy Secretary General, INTOSAI WGEA

INTOSAI WGEA 23rd Assembly – MALTA 2025

Commentaries from representatives of SAIs and oversight bodies in Finland, Brazil, and the European Court of Auditors highlighted the challenges of fragmented data, siloed reporting structures, and the lack of integrated frameworks for assessing cross-sectoral environmental outcomes.



1. Sami Yläoutinen – SAI Finland

- Sami highlighted New Zealand's success in implementing public financial management reforms. He noted that while many countries struggle to move beyond discussion, New Zealand has managed to institutionalize change effectively.
- Drawing from his experience, Sami emphasized how fragmented data across agencies leads to fragmented policy responses. He shared a personal anecdote about the difficulty of answering a seemingly simple question—how much is spent on children—due to the lack of integrated financial data.
- He stressed the need for cross-agency collaboration and integrated systems to improve transparency and decision-making. The current siloed structures hinder both analysis and accountability.

2. Ramona Bortlowski – European Court of Auditors

- Ramona reflected on the difficulty of evaluating public spending outcomes. She noted that even basic expenditure tracking can be labor-intensive and slow, which complicates efforts to assess policy effectiveness.
- She echoed concerns about fragmented governance, particularly in the environmental sector. Ramona emphasized that without coordinated data and policy frameworks, governments struggle to respond effectively to complex challenges.
- Her commentary suggested that these issues are not unique to one country but are prevalent across EU member states. She advocated for stronger institutional mechanisms to support evidence-based policymaking.

3. Hugo Freire – SAI Brazil

- Hugo emphasized the evolving role of auditors—not just as watchdogs but as contributors to policy development. He noted that SAIs are increasingly involved in synthesizing environmental data and supporting governance reforms.
- He discussed Brazil's efforts to improve coordination of environmental data, highlighting the importance of building systems that support both accountability and sustainability.
- Hugo stressed the value of international cooperation among audit institutions. He sees shared learning and joint initiatives as essential to tackling global governance challenges.