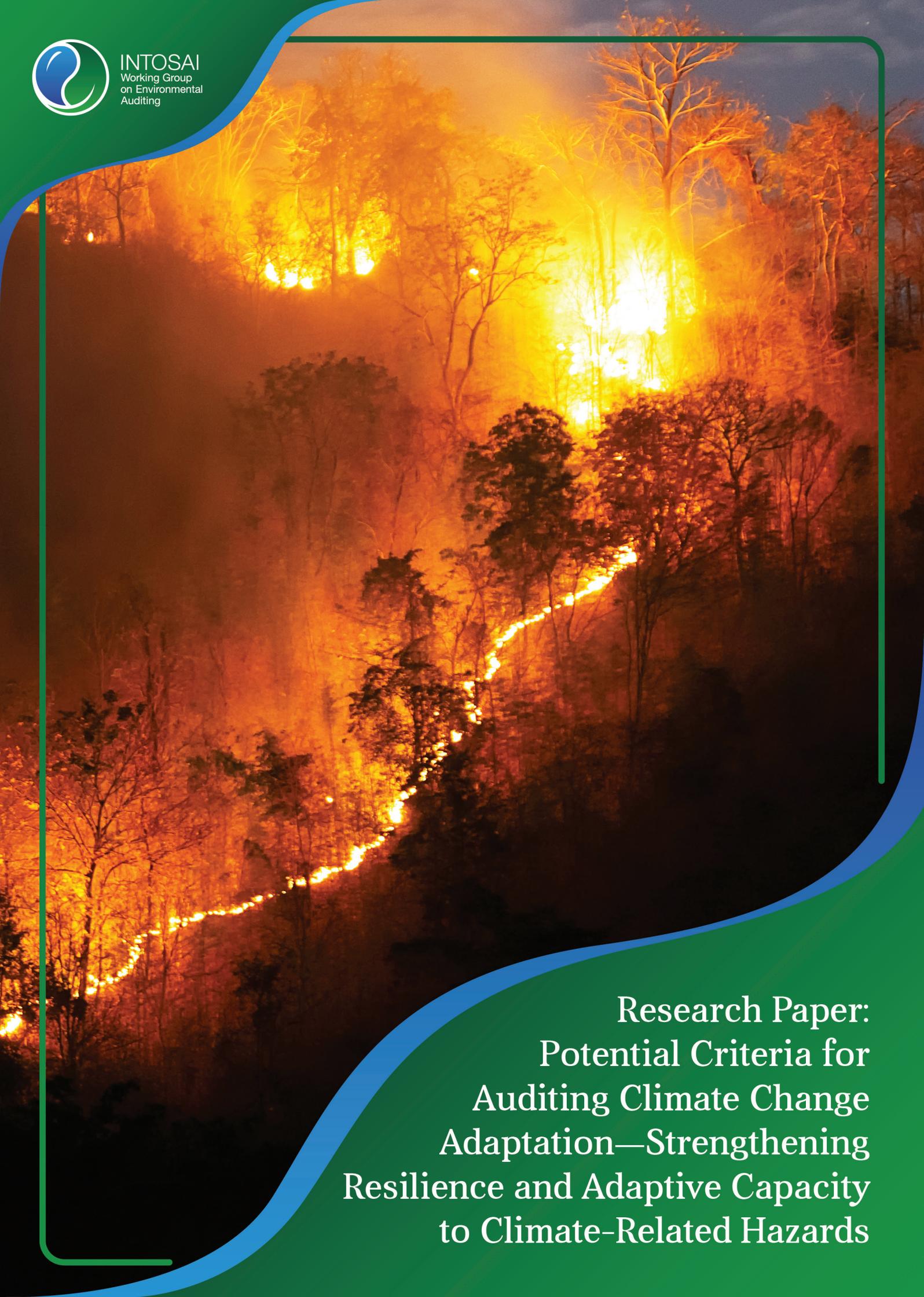




INTOSAI
Working Group
on Environmental
Auditing



Research Paper:
Potential Criteria for
Auditing Climate Change
Adaptation—Strengthening
Resilience and Adaptive Capacity
to Climate-Related Hazards



This publication was prepared by the INTOSAI Working Group on Environmental Auditing (WGEA). The WGEA aims to improve the use of audit mandate and audit instruments in the field of environmental protection policies, by both members of the Working Group and non-member Supreme Audit Institutions (SAIs). The WGEA has the mandate to

- Assists supreme audit institutions (SAIs) in acquiring a better understanding of the specific issues involved in environmental auditing;
- Facilitates exchange of information and experience among SAIs; and
- Publishes guidelines and other informative material for their use.

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July 2019

Acknowledgements & Foreword

For the International Organisation of Supreme Audit Institutions (INTOSAI) Working Group on Environmental Auditing's (WGEA) 2017-2019 Work Plan, the Supreme Audit Institution (SAI) of the United States volunteered to lead a research project focused on identifying potential criteria for auditing government efforts to strengthen resilience and adaptive capacity to climate-related hazards.

We conducted this research to learn more about potential criteria that SAIs could use to audit their governments' preparedness for implementing the United Nation's 2030 Agenda for Sustainable Development (2030 Agenda) Sustainable Development Goal (SDG) 13.1: to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters.

This is an emerging area with few studies from which to draw best practices for planning audits. As such, this research paper is meant to help SAIs learn about potential criteria that could be applied to future studies, which would enable the development of best practices. This research paper includes key questions and example frameworks related to SDG 13.1. Readers can refer to individual chapters or use the entire paper to plan audits. We conducted the research for use by SAIs in all countries, as well as state or local governments interested in audit preparedness for climate-related hazards and natural disasters. The paper is also intended to supplement the WGEA project from the 2017-2019 work plan on "Delivering the 2030 Agenda (Sustainable Development Goals) Focusing on Environmental Auditing."¹

The research paper is consistent with relevant INTOSAI Principles and Standards. The structure of the research paper is in line with the drafting convention of documents that are not part of the INTOSAI Framework of Professional Pronouncements.

Project Leader: United States Government Accountability Office (US GAO)

Subcommittee members: Canada, Malaysia, New Zealand, Zambia



Prof. Dr. Moermahadi Soerja Djanegara, CA., CPA.
Chairman of the Audit Board of the Republic of
Indonesia
Chair of INTOSAI WGEA

¹ Visit <https://www.environmental-auditing.org/publication/> for other publications that intend to fulfill this work plan.



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**Quality Assurance Certificate of the
Chair of INTOSAI Working Group on Environmental Auditing (WGEA)**

This is to certify that ***Research Paper: Potential Criteria for Auditing Climate Change Adaptation – Strengthening Resilience and Adaptive Capacity to Climate-Related Hazards*** which is placed at level three of Quality Assurance as defined in the paper on “Quality Assurance on Public Goods developed outside Due Process” approved by INTOSAI Governing Board in November 2017 has been developed by following the Quality Assurance processes as detailed below:

- i. The project proposal was developed by the team with consultation of INTOSAI WGEA Steering Committee Members;
- ii. The project was discussed during the 15th INTOSAI WGEA Steering Committee Meeting at Washington D.C- USA. in 2017 and further discussed during parallel session of 18th INTOSAI WGEA Assembly Meeting in Bandung-Indonesia;
- iii. The project output draft was circulated among team members, steering committee members, and has gone through more than 30-day exposure (from 22 March to 10 May 2019) for comments at INTOSAI WGEA website and circulated among WGEA members.

The product developed is consistent with relevant INTOSAI Principles and Standards. The structure of the product is in line with the drafting convention of non-IFPP documents.

The product is valid until 30 September 2025 and if it is not reviewed and updated by 30 September 2025, it will cease to be a public good of INTOSAI developed outside the Due Process.

Jakarta, July 2019

Prof. Dr. Moermahadi Soerja Djanegara, CA.CPA
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Quality Assurance Certificate

Chair of the Goal 3: Knowledge Sharing and Knowledge Services Committee

Based on the assurance provided by the Chair of the **Working Group on Environmental Auditing** and the assessment by the Goal Chair, it is certified that the **Research Paper: Potential Criteria for Auditing Climate Change Adaptation-Strengthening Resilience and Adaptive Capacity to Climate-Related Hazards** which is placed at level **3(three)** of Quality Assurance as defined in the paper on "Quality Assurance on Public goods developed outside Due Process" approved by the INTOSAI Governing Board in November 2017, has been developed by following the Quality Assurance process as detailed in the Quality Assurance Certificate given by the Working Group Chair.

The product is valid till **30th September 2025** and, if not reviewed and updated by **30th September 2025** it will cease to be a public good of INTOSAI developed outside the Due Process.



Rajiv Mehrishi
Chair of INTOSAI Knowledge Sharing and
Knowledge Services Committee

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Executive Summary

Sustainable Development Goal (SDG) 13.1 and the Sendai Framework for Disaster Risk Reduction provide high-level targets to help national governments strengthen resilience to climate-related hazards and natural disasters. The indicators defined by these frameworks are useful for focusing national government efforts, but are generally too high-level for SAIs to use as criteria for performance audits of specific government initiatives. To address this challenge, this research paper focuses on assessing national preparedness to achieve SDG 13.1 and conducting performance audits. In particular, this document:

- (1) describes current international frameworks for strengthening resilience and adaptive capacity and emergent SAI efforts to evaluate national preparedness; (see Chapter V)
- (2) provides criteria for conducting performance audits of specific government initiatives to strengthen resilience and adaptive capacity and examples of how SAIs have employed these criteria in practice; and (see Chapter VI)
- (3) shows how SAIs can integrate multiple performance audits of specific government initiatives into a greater body of work that informs whether national governments are progressing toward the crosscutting high-level international goals defined by SDG 13.1 and the Sendai Framework. (see Chapter VII)

The areas of audit related to climate change and sustainable development goals are relatively new. This document provides readers a first step in an emerging area and provides opportunities for further exploration in future WGEA Work Plans.

Chapter 1

Introduction

A recent report issued by the United Nations (UN) shows that over the last 20 years, 6,457 recorded floods, storms, heatwaves, droughts and other weather-related events have caused 90 percent of major disasters.² The report further demonstrates that since the first UN Climate Change Conference in 1995, weather-related disasters have led to the loss of 606,000 lives and left 4.1 billion people injured, homeless, or in need of emergency assistance.

According to the Intergovernmental Panel on Climate Change, the number of extreme weather events will increase in the future due to climate change.³ These types of extreme weather events are also projected to increase in intensity, triggering natural disasters or emergencies that will negatively impact human health. Moreover, populations in developing countries will likely be more affected by these extreme weather events. The impact of weather-related disasters in poor countries may be 20 to 30 times larger than in industrialized countries due to relatively lower socioeconomic conditions. Climate-related hazards also pose increasing financial risks to national governments around the world in the form of loss of life, costs to respond, and costs to rebuild, among other things. In 2015, the UN reported that estimates for the global costs of storms alone exceeded \$1 trillion over the previous two decades.⁴

² Centre for Research on the Epidemiology of Disasters and United Nations Office for Disaster Risk Reduction, *The Human Cost of Weather-Related Disasters 1995-2015*, (Geneva, Switzerland: 2015).

³ International Panel on Climate Change, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Summary for Policy Makers)*, Core Writing Team, R.K. Pachauri and L.A. Meyer, Eds., (Geneva, Switzerland: 2014).

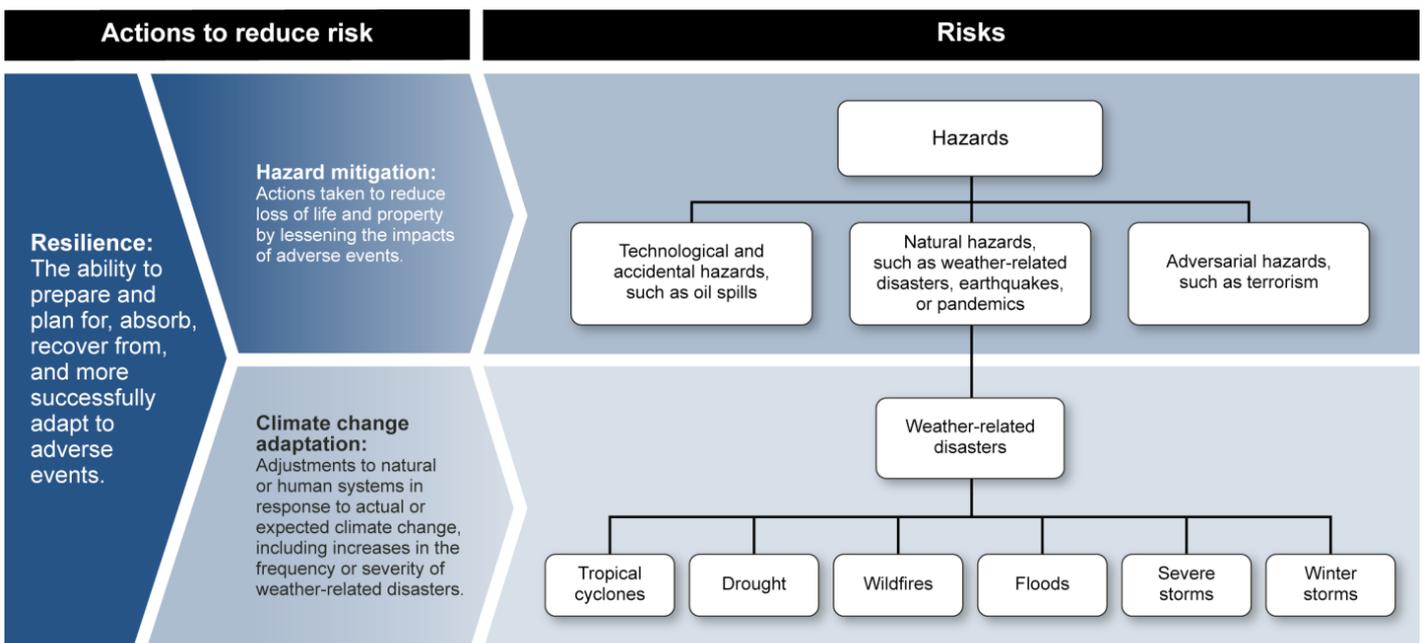
⁴ Centre for Research on the Epidemiology of Disasters and United Nations Office for Disaster Risk Reduction, *The Human Cost of Weather-Related Disasters 1995-2015*, (Geneva, Switzerland: 2015).

Chapter 2

Background

The International Panel on Climate Change has described a number of vulnerabilities and impacts of climate-related hazards; these hazards are expected to increase in frequency and severity. One strategy to help limit a nation’s fiscal exposure to climate-related hazards is to build resilience by taking actions to reduce vulnerabilities to the effects of extreme weather and adapt to the effects of climate change (see fig. 1).

Figure 1: Relationship among Risks, Resilience, Hazard Mitigation, and Climate Change Adaptation



Source: GAO analysis of Presidential Policy Directive 8, previous GAO work, and National Oceanic and Atmospheric Administration data. | GAO-16-454

Chapter 3

Project Scope and Methodology

The 193 countries that adopted the 2030 Agenda in 2015 committed to engage in systematic follow-up, monitoring, and review of the sustainable development goals to contribute to effective implementation and help countries maximize and track progress.⁵

In the first years, the review processes are expected to focus on the integration of the sustainable development goals into national development plans, strategies, and policies. This has typically involved mapping the sustainable development goals to existing government policies, programs, and agencies. In later years, the review will focus on actual achievement of the sustainable development goals, monitoring progress against targets and indicators, evaluating policies and programs, and reporting on progress.

A theme of these initial mappings has been the cross-cutting nature of the sustainable development goals across multiple policies, programs, and agencies, and the need for coordination and collaboration.

As agreed upon in the project plan we presented to WGEA in fall 2017, this research paper supports government efforts to monitor and review national-level integration and achievement of sustainable development goals associated with SDG 13.1, Strengthen Resilience and Adaptive Capacity to Climate-Related Hazards. As required by the INTOSAI Committee on Knowledge Sharing and Knowledge Services, we also completed the certificate of quality assurance appropriate for the quality assurance level of this product—level three—which requires that products have been subjected to rigorous quality control measures within the body or working group responsible for their development.

The primary goal of this effort is to lay out a road map for how SAIs can conduct specific performance audits to evaluate national progress towards regional and global indicators

⁵ UN General Assembly. *Transforming Our World: the 2030 Agenda for Sustainable Development (A/RES/70/1)*. October 21, 2015: <https://sustainabledevelopment.un.org/post2015/transformingourworld/publication> [accessed February 21, 2019].

defined by SDG13.1, “Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries,” and the related Sendai framework. As noted above, this is an emerging area with few studies from which to draw best practices. As such, we are offering this research as a first step to help SAs apply existing criteria to studies to enable the development of best practices in the future. Our methodology includes a review of existing relevant criteria, as well as information gathered from a mini-survey of WGEA members conducted in 2018. This document is a specific case under Project 2.1(h): Delivering the 2030 Agenda focusing in Environmental Auditing.⁶

⁶ Visit <https://www.environmental-auditing.org/publication/> for other publications that intend to fulfill this work plan.

Chapter 4

International frameworks for strengthening resilience and adaptive capacity to climate-related hazards and natural disasters

A number of international agreements have sought to address challenges related to climate change. The Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015-2030 provide a set of common national, regional, and global indicators and targets to help national governments manage the risks of climate change and natural disasters and build back better after a crisis. Specifically, these two agreements provide frameworks for strengthening resilience and adaptive capacity to climate-related hazards and natural disasters. These frameworks provide common high-level goals for national governments to strive towards. In addition, in 2015, parties to the United Nations Framework Convention on Climate Change (UNFCCC) reached an agreement—the Paris Agreement—to combat climate change. The Paris Agreement aims to strengthen the global climate change response by increasing the ability of all to adapt to adverse impacts of climate change and foster climate resilience. It defines a global goal on adaptation: to enhance adaptive capacity and resilience; and to reduce vulnerability, with a view to contributing to sustainable development.⁷

SUSTAINABLE DEVELOPMENT GOALS

“Transforming Our World: The United Nations 2030 Agenda for Sustainable Development” includes 17 goals and 169 targets (see Appendix III) for all countries to pursue as they look to the future.⁸ One of the goals is SDG 13: Take Urgent Action to Combat Climate Change and its Impact; the target of SDG 13.1 is to strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. In addition, there are 232 indicators covering all the goals and targets that were developed by the Inter-Agency and Expert Group on SDG indicators (IAEG-SDGs) and endorsed by the UN Statistical Commission in March 2016.

The 2030 Agenda members commit to engage in systematic follow-up, monitoring and review to contribute to effective implementation and help countries maximize and track progress. In the first years, the review processes are expected to focus on the integration of the sustainable development goals into national development plans, strategies and policies. This has typically involved mapping the sustainable development goals to existing government policies, programs, and agencies. A theme of these initial mappings has been the crosscutting nature of the goals across multiple policies, programs, and agencies, and the need for coordination and collaboration. In later years, the review will focus on actual achievement of the sustainable development goals, monitoring progress against the target and the associated indicators, evaluating policies and programs, and reporting on progress. The core of the review framework is expected to occur at the national level.

⁷ In 1992, the United States and most other countries negotiated the United Nations Framework Convention on Climate Change (UNFCCC) with the aim of addressing climate change through adaptation and mitigation.

⁸ *Transforming Our World: The 2030 Agenda for Sustainable Development*.

UN SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION

The Sendai Framework is a 15-year, voluntary, non-binding agreement that recognizes that the national government of each country has the primary role to reduce disaster risk, but the responsibility should be shared with other stakeholders, including local government, the private sector, and other stakeholders.⁹ It aims to substantially reduce disaster risk and losses in lives, livelihoods, and health, and in the economic, physical, social, cultural, and environmental assets of people, businesses, communities, and countries. The Sendai Framework sets out specific targets and priorities for action with a strong emphasis on disaster risk management, the reduction of disaster risk, the prevention of new risk, reducing existing risk, and strengthening resilience.

According to the UN Office for Disaster Risk Reduction, sustainable development cannot be attained while disasters continue to undermine economic growth and social progress. No country or sector is immune to the impacts of natural hazards, many of which are increasing in frequency and intensity due to the impacts of climate change. While critical, simply preparing for disasters is not enough. To realize the transformative potential of the 2030 Agenda for Sustainable Development, governments and stakeholders have affirmed that disaster risk reduction needs to be at the core of sustainable development. The Sendai Framework for Disaster Risk Reduction 2015-2030 was the first agreement of the post-2015 development agenda. It includes seven global targets accompanied by four priorities for action that give direction to reduce the impact of disasters, while also addressing the underlying drivers of disaster risk and safeguarding current and future development gains (see fig. 2).

Figure 2: Sendai Framework for Disaster Risk Reduction 2015-2030

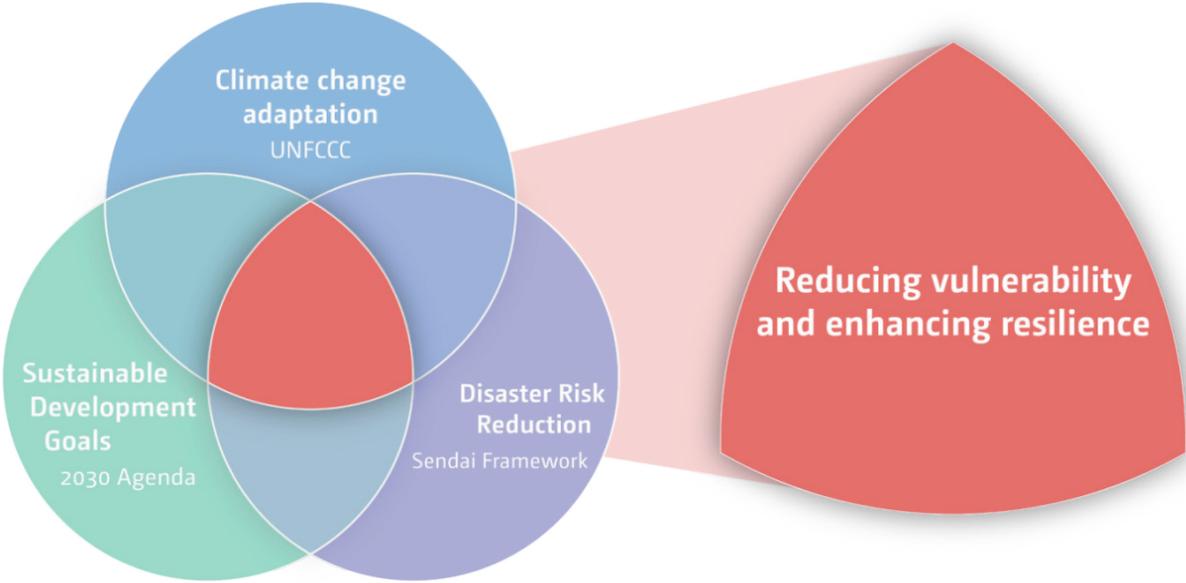
Sendai Framework for Disaster Risk Reduction 2015-2030						
Goal						
Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political, and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.						
Global Targets						
(A) Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality rate in the decade 2020-2030 compared to the period 2005-2015.	(B) Substantially reduce the number of affected people globally by 2030, aiming to lower average global figure per 100,000 in the decade 2020-2030 compared to the period 2005-2015.	(C) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.	(D) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.	(E) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.	(F) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this Framework by 2030.	(G) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.
Priorities for Action						
Priority 1: Understanding disaster risk.	Priority 2: Strengthening disaster risk governance to manage disaster risk.	Priority 3: Investing in disaster risk reduction for resilience.	Priority 4: Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction.			

Source: United Nations Office for Disaster Risk Reduction, *Sendai Framework for Disaster Risk Reduction 2015-2030*, (Geneva, Switzerland: 2015).

⁹ United Nations Office for Disaster Risk Reduction, *Sendai Framework for Disaster Risk Reduction 2015-2030*, (Geneva, Switzerland: 2015).

Progress in implementing the Sendai Framework is therefore progress towards meeting the sustainable development goals. In turn, progress on the sustainable development goals can substantially build the resilience of people and governments in the face of disasters. There are a number of targets across the 17 sustainable development goals that are related to disaster risk reduction. Conversely, all seven global targets of the Sendai Framework are critical for the achievement of the sustainable development goals (see fig. 3).

Figure 3: Integrating Adaptation with the Sustainable Development Goals and the Sendai Framework



Source: United Nations Climate Change Secretariat, *Technical Paper: Opportunities and Options for Integrating Climate Change Adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015-2030* (Geneva, Switzerland: 2017).

Specifically, the Sendai Framework contributes to SDG 13 and recognizes that reducing the risk of disasters is a fundamental aspect of climate change adaptation and sustainable development. Over the last two decades, more than 90 percent of major disasters have been caused by floods, storms, heatwaves, droughts, and other weather-related events that are expected to increase in frequency and severity as a consequence of climate change. These events, in turn, can trigger or contribute to wildfires, famine, health emergencies, and other disasters. By establishing resilience-building as the core target to be reached by 2030, the Sendai Framework shifts member’s priorities from managing disasters to managing current and future risks, including those that are expected to worsen with climate change.

Chapter 5

The Role of SAIs in Auditing Sustainable Development Goals

The INTOSAI community responded to the 2030 Agenda by including sustainable development goals as a crosscutting priority in its strategic plan for the period 2017-2022. Crosscutting Priority 2 is “Contributing to the follow-up and review of the sustainable development goals within the context of each nation’s specific sustainable development efforts.” The strategic plan identifies four broad approaches SAIs can take to make valuable contributions at the national, regional, and global levels toward the achievement of the sustainable development goals. These four approaches are:

1. assessing the readiness of national systems to report on progress toward the achievement of the sustainable development goals, and subsequently to audit their operation and the reliability of the data they produce;
2. undertaking performance audits that examine the economy, efficiency, and effectiveness of key government programs that contribute to specific aspects of the sustainable development goals;
3. assessing and supporting the implementation of SDG 16, which relates in part to transparent, efficient, and accountable institutions; and
4. being models of transparency and accountability in own operations.

The purpose of this research paper is to help SAIs better understand how to apply existing criteria to performance audits, in an effort to improve their governments’ preparedness for implementing the United Nation’s 2030 Agenda. As such, this research paper focuses on the first two approaches, which are discussed in further detail below.

APPROACH 1: ASSESSING NATIONAL PREPAREDNESS

With regard to the first approach, this working group developed a guidance document for SAIs to audit the government response to climate change.¹⁰ That document serves as a useful resource for climate change audits. In particular, it provides audit criteria for climate change policy; steps and key questions to consider in designing mitigation and adaptation audits; and examples of mitigation and adaptation audits. In terms of assessing national preparedness, it provides considerations when designing a climate change audit.

Building upon these key questions, SAIs could consider three additional key questions when assessing national preparedness with a focus on the target in SDG 13.1:

1. To what extent has the government adapted the 2030 Agenda to its national context?
2. To what extent has the government identified and secured resources and capacities (means of implementation) to implement the 2030 Agenda?
3. To what extent has the government established a mechanism to monitor, follow up, review and report on the progress toward implementation of the 2030 Agenda?

In addition, The International Standards of Supreme Audit Institutions developed a document on the audit of disaster risk reduction to assist SAIs in the audit of disaster risk reduction by governments. This document provides advice on the recommendations which SAIs may make regarding the good use of public funds and the value of investing in pre-disaster measures, as well as guidance and good practices on auditing disaster risk reduction.¹¹

APPROACH 2: PERFORMANCE AUDITS

While many SAIs have their roots in conducting financial audits, many, but not all, have expanded their audit portfolio to include performance audits. Performance audits attempt to provide insight into the management and outcomes of different government activities, asking questions about the value of government funding and exploring ways to spend money more effectively. Performance auditing is an independent examination of the efficiency and effectiveness of government undertakings, with due regard to economy and the aim of leading to improvements in achieving outcomes.

This paper provides “how to” advice to SAI audit teams in using a whole-of-government approach to planning, conducting, and reporting on performance audits.¹² This approach reflects the International Standards of Supreme Audit Institutions that WGEA members have discussed related to government preparedness for implementing the 2030 Agenda.

SAI performance audits are a tool to gather findings that support national reviews of actual achievement of the sustainable development goals, monitoring progress against targets and indicators, evaluating policies and programs, and reporting on progress. A finding summarizes the evidence gathered and developed during a performance audit and is the factual basis for conclusions and any recommendations. In reporting a finding, an SAI audit team should include sufficient and appropriate evidence to ensure adequate understanding of the matters reported and provide a convincing and fair case. A finding or set of findings is complete to the extent that the audit objectives are satisfied and the report clearly relates the audit objectives to the elements of a finding.

¹⁰ INTOSAI WGEA, *Auditing the Government Response to Climate Change: Guidance for Supreme Audit Institutions*, 2010.

¹¹ INTOSAI General Secretariat, Working Group on Accountability for and the Audit of Disaster-Related Aid, *The Audit of Disaster Risk Reduction*, International Standards of Supreme Audit Institutions 5510, 2013.

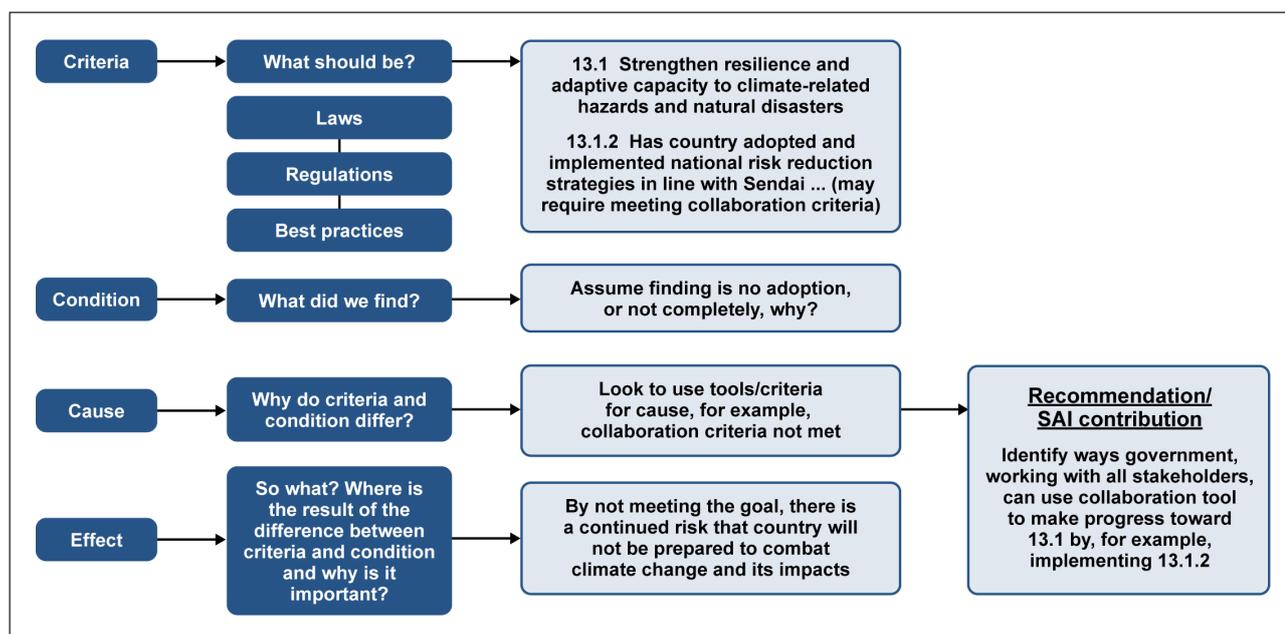
¹² For the purpose of this research paper, the term “whole-of-government” refers to joint activities performed by diverse ministries, offices, and agencies, to provide a common solution to a particular problem or issue.

There are four elements of a finding: (1) criteria, (2) condition, (3) cause, and (4) effect. Not all audit objectives require all the elements of a finding, but an audit team should include the appropriate elements to produce accurate and defensible findings. The elements needed for a finding depend on the audit and the types of objectives being addressed.

1. **Criteria** are the standards used to determine whether a program meets or does not meet expectations. Criteria determine “what should be” and provide a context for understanding the results of an audit.¹³
2. **Condition** describes the situation that exists—“what is”—or circumstances that have been observed and documented during the engagement. At a minimum, all reports should include a description of condition.
3. **Cause** is the reason something happened or did not happen—the “why.” It is the underlying reason or reasons why things are not working as expected—that is, why the condition varies from the criteria.
4. **Effect** describes the actual or potential consequences of a condition that varies from the criteria—the “so what.” Determining effect is frequently necessary to stimulate agency action on recommendations. Thus, the determination of effect must be sufficiently convincing.

For an example of how to design a performance audit related to SDG 13.1 using all four elements of a finding, see figure 4.

Figure 4: Performance Audit Elements of a Finding Using UN Sustainable Development Goals and Tools as Criteria



Source: GAO.

¹³ Criteria can be found in such sources as laws, regulations, policies, written procedures, or accepted standards or practices. Criteria should be reasonable, attainable, and relevant to the matters being evaluated.

The Supreme Audit Institute of the United States, the Government Accountability Office (GAO), used the elements of a finding framework to guide audit work for a performance audit on building design standards, codes, and certifications (see figure 5).¹⁴ GAO was asked to conduct this audit because federal, state, local, and private decision makers use design standards, building codes, and voluntary certifications in the construction of infrastructure. Standards-developing organizations, such as professional engineering societies, issue standards, model codes, and certifications. By identifying the four elements of a finding, GAO developed a well-supported recommendation to reduce federal fiscal exposure by enhancing the resilience of infrastructure to extreme weather.

Figure 5: Using Elements of a Finding Framework to Guide Audit Work on Building Design Standards for Climate Change Resilience

Element	Finding
Criteria	Federal policy directs agency standards executives—senior-level officials who coordinate agency participation in standards organizations—to coordinate their views when they participate in the same standards activities so as to present, whenever feasible, a single, unified position. The policy also directs the Secretary of Commerce, who has delegated the responsibility to the National Institute of Standards and Technology (NIST), to coordinate and foster executive branch implementation of the policy governing federal participation in the development of voluntary consensus standards.
Condition	We have previously found that using the best available climate information, including forward-looking projections, can be a part of a risk-management strategy for federal, state, local, and private-sector decisions and investments. Standards-developing organizations, not federal agencies, are the primary source for standards, codes, and certifications that specify how weather and climate information is considered in infrastructure planning. These organizations face institutional and technical challenges to using forward-looking climate information. Officials from some federal agencies, including the Federal Emergency Management Agency, and the U.S. Global Change Research Program (USGCRP) told us that they have provided forward-looking climate information to standards-developing organizations to a limited extent because they do not have clear direction to do so.
Cause	Officials from the Executive Office of the President and federal agencies told us that they have not specifically coordinated efforts to help standards-developing organizations use the best available forward-looking climate information.
Effect	Representatives of several standards-developing organizations stated that improved coordination among federal agencies could help increase the legitimacy and visibility of efforts to use forward-looking climate information in standards, codes, and certifications. Federal agencies that participate in the standards-developing process and respond to climate-related issues could help address technical challenges by providing the best available forward-looking climate information for consideration in the standards-developing process, according to reports we reviewed, our prior work, and representatives of some standards-developing organizations and federal agency officials we interviewed.
Recommendation	To help reduce federal fiscal exposure by enhancing the resilience of infrastructure to extreme weather, the Secretary of Commerce, through the Director of NIST, in consultation with the Mitigation Framework Leadership Group and USGCRP, should convene federal agencies for an ongoing government-wide effort to provide the best available FORWARD-looking climate information to standards-developing organizations for their consideration in the development of design standards, building codes, and voluntary certifications.

Source: United States Government Accountability Office, *Climate Change: Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications*, GAO-17-3 (Washington, D.C., United States: 2017).

14. United States Government Accountability Office, *Climate Change: Improved Federal Coordination Could Facilitate Use of Forward-Looking Climate Information in Design Standards, Building Codes, and Certifications*, GAO-17-3 (Washington, D.C., United States: 2017).

Chapter 6

Criteria for Performance Audits and Assessing National Preparedness for Strengthening Resilience and Adaptive Capacity to Climate-Related Hazards and Natural Disasters

In this chapter, we provide examples of criteria that can be used in the two approaches to achieve SDG 13.1 discussed above—assessing national preparedness and conducting individual performance audits. Where possible, we provide example audits that used the criteria discussed. We also describe some frameworks that have not yet been used in a completed audit, but show promise as potential criteria for achieving SDG 13.1. This chapter concludes with an example of a framework for using individual performance audits to audit progress toward high-level goals.

CRITERIA FOR APPROACH 1: ASSESSING NATIONAL PREPAREDNESS TO ACHIEVE SDG 13.1

It is important for SAIs to develop effective performance measures to assess their governments' preparedness to achieve SDG 13.1 and conduct program audits. Measuring performance allows governments to track the progress they are making toward their goals and gives them critical information on which to base decisions for improving their programs. Performance measures should demonstrate results, be limited to a few vital measures, cover multiple program priorities, and provide useful information for decision making to track how programs and activities can contribute to attaining the overall goals and mission.

In this section, we describe existing international indicators and present examples of criteria and other tools that can be used to assess national preparedness to achieve

SDG 13.1. Specifically, we discuss (1) the UN Inter-Agency and Expert Group indicators for SDG 13.1, (2) the Sendai Framework, and (3) GAO's key attributes of performance indicators. While the indicators defined by these frameworks are useful for focusing national government efforts, they are generally too high-level for SAIs to use as criteria for performance audits of specific government initiatives. In the next section, we discuss criteria that SAIs could use to conduct individual program audits relevant to SDG 13.1.

UN INTER-AGENCY AND EXPERT GROUP INDICATORS FOR SDG 13.1

The UN Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) is charged with developing indicators towards measuring progress toward achieving SDG goals and targets. The IAEG-SDG classifies the indicators into three tiers based on the level of methodological development and availability of data. Tier 1 is the highest classification: the indicator is clear, established methodology is available, and data is regularly produced (add official definitions). Tier 2 has established methodology but data is not regularly produced. Tier 3 is the lowest classification, in which there is no established methodology or the methodology or standards are being developed or will be. IAEG-SDG has work plans for Tier 3 indicators. There are currently three indicators for SDG 13.1 (as of May 2018):

- 13.1.1: "Number of deaths, missing persons, and directly affected persons attributed to disasters per 100,000 people." (Tier 2)
- 13.1.2: "Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030." (Tier 1)
- 13.1.3: "Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies." (Tier 2)

The classification for these indicators has changed over time from lower tiers. More importantly, the IAEG-SDG has turned to the Sendai Framework for Disaster Risk Reduction as a source of indicators designed to be coherent with the SDG indicators. There are also a number of related SDG targets with similar indicators. Specifically, SDG Target 1.5—by 2030, build the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters—has four related indicators:

- 1.5.1: Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
- 1.5.2: Direct economic loss attributed to disasters in relation to global gross domestic product
- 1.5.3: Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework
- 1.5.4: Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies

Further, SDG Target 11.5—by 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations—has two related indicators:

- 11.5.1: Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
- 11.5.2: Direct economic loss in relation to global gross domestic product, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters

All 17 SDGs are interrelated, as are their targets.¹⁵ For example, rising temperatures, changing precipitation patterns, and the intensity and frequency of extreme weather events adversely affect agricultural production systems—particularly those in developing countries—which in turn constrains the achievement of ‘zero hunger’ and nutritional objectives under SDG2. A better understanding of possible trade-offs, as well as relations between the different SDGs, could be crucial for achieving long-lasting, sustainable development outcomes. For a list of all 17 SDG goals and 169 targets, see appendix II.

SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION 2015-2030

The Sendai Framework includes seven global targets (labeled A through G) and four priorities for action.¹⁶ A set of 38 indicators will track progress in implementing the seven targets of the Sendai Framework as well as its related dimensions reflected in SDG 1, SDG 11 and SDG 13. The Sendai Framework Monitor will also function as a management tool to help countries develop disaster risk reduction strategies, make risk-informed policy decisions, and allocate resources to prevent new disaster risks. The Sendai Framework Monitor can contribute to Target E of the Sendai Framework related to development of actionable national and local disaster risk reduction strategies by 2020. In particular, Sendai’s Target E—to substantially increase the number of countries with national and local disaster risk reduction strategies by 2020—is in line with the indicators outlined in SDG Target 13.1. Specifically, Sendai’s subindicator E1—the number of countries that adopt and implement national disaster risk reduction strategies—is precisely the same subindicator 13.1.2 under SDG Target 13.1 (see discussion on sustainable development goals above).

KEY ATTRIBUTES OF PERFORMANCE INDICATORS

Performance goals and measures that successfully address important and varied aspects of program performance are key to a results-oriented, balanced work environment. Measuring performance allows organizations to track the progress they are making toward their goals and gives managers critical information on which to base decisions for improving their programs. GAO has developed five attributes of performance goals and measures that generally apply to individual measures (see figure 6). SAIs can refer to these attributes and features of existing indicators, including the ones described above, to develop effective performance measures that would work best for their country and systems. These attributes could also help SAIs develop performance measures as criteria for individual program audits.

¹⁵ D.J. Griggs, M. Nilsson, A. Stevance, D. McCollum, et al. *A Guide to SDG Interactions: from Science to Implementation*. International Council for Science, Paris, 2017. This report explores the nature of interlinkages between the SDGs, based on the premise that a science-informed analysis of interactions across SDG domains—which is currently lacking—can support more coherent and effective decisionmaking, and better facilitate follow-up and monitoring of progress.

¹⁶ See Chapter IV.

Figure 6: Key Attributes of Successful Individual Performance Measures

Attributes		Explanation
Linkage	Is there a relationship between the performance goals and measures and an agency's goals and mission?	Performance goals and measures should align with a government agency's goals and mission. Linkage from top management down to the operational level is important in setting goals agency-wide, and the linkage from the operational level to the agency level provides managers and staff throughout an agency with a road map that (1) shows how their day-to-day activities contribute to attaining agency-wide goals and mission and (2) helps define strategies for achieving strategic and annual performance goals.
Clarity	Are the performance measures clearly stated?	A measure has clarity when it is clearly stated and the name and definition are consistent with the methodology used for calculating the measure.
Measurable target	Do the performance measures have targets, thus allowing for easier comparison with actual performance?	Numerical targets or other measurable values facilitate future assessments of whether overall goals and objectives were achieved because comparisons can be easily made between projected performance and actual results. The measures should have a clearly apparent or commonly accepted relation to the intended performance or have been shown to be reasonable predictors of desired behaviors or events.
Objectivity	Are the performance goals and measures objective?	To be objective, performance goals and measures should indicate specifically what is to be observed, in which population or conditions, and in what time frame, and be free of opinion and judgment. Objectivity is important because it adds credibility to the performance goals and measures by ensuring that significant bias or manipulation will not distort the measure.
Reliability	To what extent do the performance goals and measures provide a reliable way to assess progress?	Reliability refers to whether measures are amenable to applying standard procedures for collecting data or calculating results so that they would be likely to produce the same results if applied repeatedly to the same situation.

Source: United States Government Accountability Office.

GAO used key attributes of successful performance measures as criteria for one of the recommendations it made for a performance audit on federal fisheries management (see figure 7).¹⁷ GAO reviewed federal efforts to address the effects of climate change on federal fisheries, which may be vulnerable to the increasing effects of climate change in the oceans. These effects could include physical changes such as warmer surface temperatures and chemical changes such as higher acidity levels—and could affect the abundance and distribution of fisheries.

¹⁷ United States Government Accountability Office, *Federal Fisheries Management: Additional Actions Could Advance Efforts to Incorporate Climate Information into Management Decisions*, GAO-16-827, (Washington, D.C., United States: 2016).

Figure 7: Using Key Attributes of Successful Performance Measures as Criteria For Audit on Federal Fisheries Management

Element	Finding
Criteria	GAO's Key Attributes of Successful Performance Measures
Condition	Three of the draft regional action plans contained proposed performance measures. We found that the measures each of the three regions proposed included some key attributes of successful performance measures that we have previously identified. However, most of the measures did not contain other key attributes
Cause	The National Marine Fisheries Service has not developed agency-wide performance measures to assess progress in meeting the strategy's overall objectives, instead choosing to wait to complete the regional action plans before determining whether such measures may be necessary.
Effect	By incorporating key attributes associated with successful performance measures in the final performance measures developed for the plans and assessing whether agency-wide performance measures may also be needed, the National Marine Fisheries Service may be in a better position to determine the extent to which the objectives of the strategy overall are being achieved.
Recommendation	GAO recommended that the National Marine Fisheries Service incorporate key attributes of successful performance measures in the regional action plans and assess whether agency-wide measures for the climate science strategy may be needed.

Source: United States Government Accountability Office, *Federal Fisheries Management: Additional Actions Could Advance Efforts to Incorporate Climate Information into Management Decisions*, GAO-16-827 (Washington, D.C., United States: 2016).

CRITERIA FOR APPROACH 2: CONDUCTING INDIVIDUAL PROGRAM AUDITS RELEVANT TO SDG 13.1

Auditing national preparedness at a whole-of-government level can be difficult, particularly without a series of performance audits that can roll up into a greater whole. In this section, we provide guidance on developing key components of performance audits relevant to SDG 13.1, including criteria for conducting performance audits of specific government initiatives to strengthen resilience and adaptive capacity and examples of how SAIs have employed these criteria in practice. Specifically, we will discuss (1) GAO's Best Practices for Collaboration, (2) GAO's Enterprise Risk Management Framework, (3) Canada's Framework for the Management of Risk, and (4) GAO's Disaster Resilience Framework.

GAO'S BEST PRACTICES FOR COLLABORATION

Collaboration can be broadly defined as any joint activity that is intended to produce more public value than could be produced when the organizations act alone. Many of the meaningful results that federal governments seek to achieve—such as those related to building resilience to climate-related hazards—require collaboration across more than one agency and often more than one sector and level of government.

To identify best practices for collaboration, GAO identified mechanisms that the U.S. government uses to lead and implement interagency collaboration, as well as issues

to consider when implementing these mechanisms.¹⁸ These practices can be applied both to assessing national preparedness to achieve SDG 13.1 and conducting individual performance audits. GAO found that, although collaborative mechanisms differ in complexity and scope, these mechanisms all benefit from certain key features (see figure 8).¹⁹ GAO found that U.S. agencies have used a variety of mechanisms to implement interagency collaborative efforts and frequently use more than one mechanism to address an issue. These mechanisms can be used to address a range of purposes, including: policy development; program implementation; oversight and monitoring; information sharing and communication; and building organizational capacity, such as staffing and training.

Figure 8: GAO’s Best Practices for Collaboration

Key features		Key considerations
	Outcomes and accountability	Have short-term and long-term outcomes been clearly defined? Is there a way to track and monitor their progress?
	Bridging organizational cultures	What are the missions and organizational cultures of the participating agencies? Have agencies agreed on common terminology and definitions?
	Leadership	How will leadership be sustained over the long-term? If leadership is shared, have roles and responsibilities been clearly identified and agreed upon?
	Clarity of roles and responsibilities	Have participating agencies clarified roles and responsibilities?
	Participants	Have all relevant participants been included? Do they have the ability to commit resources for their agency?
	Resources	How will the collaborative mechanism be funded and staffed? Have online collaboration tools been developed?
	Written guidance and agreements	If appropriate, have participating agencies documented their agreement regarding how they will be collaborating? Have they developed ways to continually update and monitor these agreements?

Source: GAO. | GAO-18-171

GAO’s best practices for collaboration served as criteria when GAO conducted audit work about the availability and accessibility of climate information and technical assistance to help decision makers build climate resilience.²⁰ Specifically, GAO considered the criteria as related to interagency collaboration to provide authoritative information on climate preparedness and resilience to decision makers (see figure 9).

18 To examine mechanisms that the U.S. federal government uses to lead and implement interagency collaboration, GAO conducted a literature review on interagency collaborative mechanisms, interviewed 13 academic and practitioner experts in the field of collaboration, and reviewed their work. GAO also conducted a detailed analysis of 45 GAO reports, published between 2005 and 2012. GAO selected reports that contained in-depth discussions of collaborative mechanisms and covered a broad range of issues.

19 For further explanation of the key features in GAO’s best practices for collaboration, see United States Government Accountability Office, *Workforce Innovation and Opportunity Act: Federal Agencies’ Collaboration Generally Reflected Leading Practices, but Could Be Enhanced*, GAO-18-171, (Washington, D.C., United States: 2018).

20 United States Government Accountability Office, *Climate Information: A National System Could Help Federal, State, Local, and Private Sector Decision Makers Use Climate Information*, GAO-16-37, (Washington, D.C., United States: 2016).

Figure 9: Using Best Practices for Collaboration as Criteria For Audit on Climate Information

Element	Finding
Criteria	<p>GAO's key practices to enhance and sustain interagency collaboration include:</p> <ul style="list-style-type: none"> • agreeing on roles and responsibilities and establishing mutually reinforcing or joint strategies and • having a clear and compelling rationale to work together to overcome significant differences in agency missions, cultures, and established ways of doing business. <p>For example, key features of interagency efforts to collaborate include clearly defined short-term and long-term outcomes, common terminology and definitions, agreement on how the effort will be funded and staffed, and committed leadership.</p> <p>Executive Order 13653 on Preparing the United States for the Impacts of Climate Change calls on certain federal agencies to work together to provide authoritative information on climate preparedness and resilience.²¹</p>
Condition	<p>Federal fiscal exposures due to changes in climate are partly driven by state, local, and private sector decision makers responsible for planning, constructing, and maintaining certain types of vulnerable infrastructure paid for with federal funds, insured by federal programs, or eligible for federal disaster assistance.</p> <p>The federal government's climate data—composed of observational records from satellites and weather stations and projections from climate models—are fragmented across individual agencies that use the information in different ways to meet their missions.</p>
Cause	<p>Because federal climate information efforts are fragmented, state, local, and private sector decision makers generally do not understand how to access and use the best available authoritative information they need to account for climate risk in planning processes, according to principles of risk management.</p>
Effect	<p>A national climate information system with federal leadership, authoritative federal data and quality assurance guidelines, and a nonfederal provider of technical assistance may make it easier for federal, state, local, and private sector decision makers to justify the costs of incorporating climate change information into planning efforts, thereby reducing long-term federal fiscal exposure.</p>
Recommendation	<p>To help federal, state, local, and private sector decision makers access and use the best available climate information, we recommend that the Executive Office of the President designate a federal entity to take the following two actions: develop and periodically update a set of authoritative climate change observations and projections for use in federal decision making, which state, local, and private sector decision makers could also access to obtain the best available climate information; and create a national climate information system with defined roles for federal agencies and nonfederal entities with existing statutory authority.</p>

Source: United States Government Accountability Office, *Climate Information: A National System Could Help Federal, State, Local, and Private Sector Decision Makers Use Climate Information*, GAO-16-37, (Washington, D.C., United States: 2016).

GAO'S ENTERPRISE RISK MANAGEMENT BEST PRACTICES

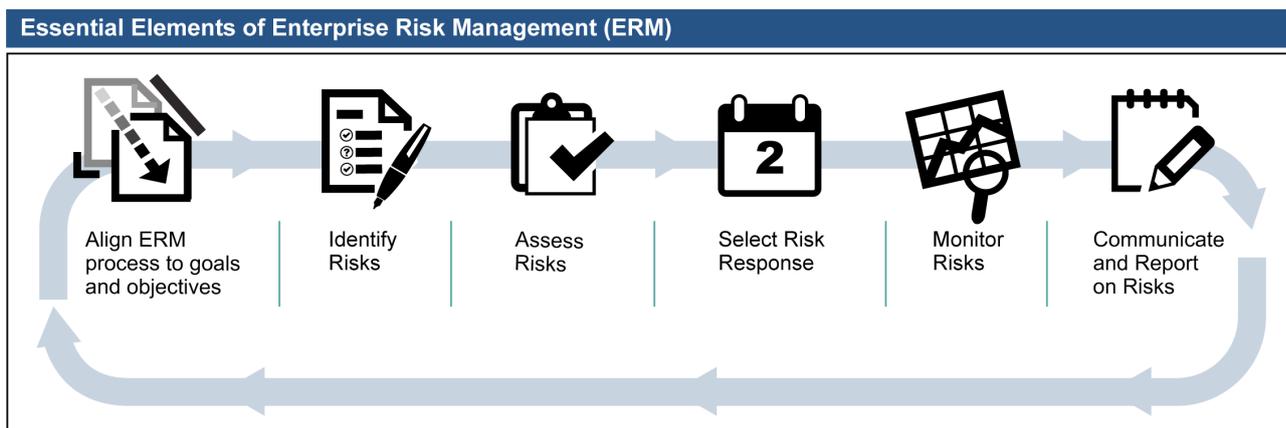
GAO has identified key elements of enterprise risk management (ERM) that could be used as criteria to evaluate the extent to which an agency is managing the risk to agency mission and goals from the impacts of climate change.

While it is not possible to eliminate all uncertainties when managing complex and inherently risky agency goals such as preparing for natural disasters, it is possible to put in place strategies to better plan for and manage them. GAO identified ERM as one tool that can assist federal leaders in anticipating and managing risks, as well as considering how multiple risks in their agency can present even greater challenges and opportunities when examined as a whole. While there are a number of different frameworks for ERM, GAO identified essential elements for an agency to carry out ERM effectively (see figure 10).²² SAIs can use the elements, or those from other ERM frameworks, as criteria for evaluating risk management practices.

²¹ On March 28, 2017, President Trump revoked Executive Order 13653 on Preparing the United States for the Impacts of Climate Change.

²² For a full explanation of each element of the ERM and how to evaluate their implementation, see the full GAO report: *Enterprise Risk Management: Selected Agencies' Experiences Illustrate Good Practices in Managing Risk* at <https://www.gao.gov/assets/690/681342.pdf>.

Figure 10: GAO’s Enterprise Risk Management Best Practices



Source: GAO. | GAO-17-63

Elements of ERM

Align the ERM process to agency goals and objectives. Ensure the ERM process maximizes the achievement of agency mission and results. Agency leaders examine strategic objectives by regularly considering how uncertainties—both risks and opportunities—could affect the agency’s ability to achieve its mission.

Identify risks. Assemble a comprehensive list of risks—both threats and opportunities—that could affect the agency in achieving its goals and objectives. Agency officials systematically identify the sources of risks as they relate to strategic objectives by examining internal and external factors that could affect their accomplishment.

Assess risks. Examine risks considering both the likelihood of the risk and the impact of the risk on the mission to help prioritize risk response. Agency leaders, risk owners, and subject matter experts assess each risk by assigning the likelihood of the risk’s occurrence and the potential impact if the risk occurs.

Select risk response. Select a risk treatment response (based on risk appetite) including acceptance, avoidance, reduction, sharing, or transfer. Agency leaders review the prioritized list of risks and select the most appropriate treatment strategy to manage the risk.

Monitor Risks. Monitor how risks are changing and if responses are successful. After implementing the risk response, agencies must monitor the risk to help ensure that the entire risk management process remains current and relevant.

Communicate and Report on Risks. Communicate risks with stakeholders and report on the status of addressing the risks. Communicating and reporting risk information informs agency stakeholders about the status of identified risks and their associated treatments, and assures them that agency leaders are managing risk effectively.

Example of ERM

As of October 2018, GAO is conducting a performance audit that will use the above ERM framework elements as criteria to evaluate the extent to which the United States’ Environmental Protection Agency (EPA) is managing the risks to human health and the environment from potential climate change effects at former industrial and mining sites that have been contaminated with hazardous substances. Potential climate change effects—such as increased flooding, sea level rise, and more frequent wildfires—may increase the possibility of contaminants from these sites negatively impacting human health and the environment if risks are not managed effectively.

To determine the extent to which EPA's actions align with each ERM element (our criteria), GAO analysts will interview EPA officials who oversee the cleanup of these sites. GAO analysts will also interview other stakeholders—such as community groups, state government officials, and representatives of companies that conduct the site cleanups—for their perspectives. GAO analysts will also review EPA guidance and policy documents on the management and cleanup of these sites, as well as documents that reflect the decision making process for determining the management of risks at individual sites. GAO's review of the testimonial and documentary evidence will help analysts identify condition and determine possible cause and effect.

This audit work would allow GAO to identify the extent to which EPA policies and activities to manage risks at these sites align with elements of ERM. If appropriate, GAO would make recommendations to EPA for actions the agency can take to help manage risks to human health and the environment from the effects of climate change at these sites.

Example of Using Components of ERM

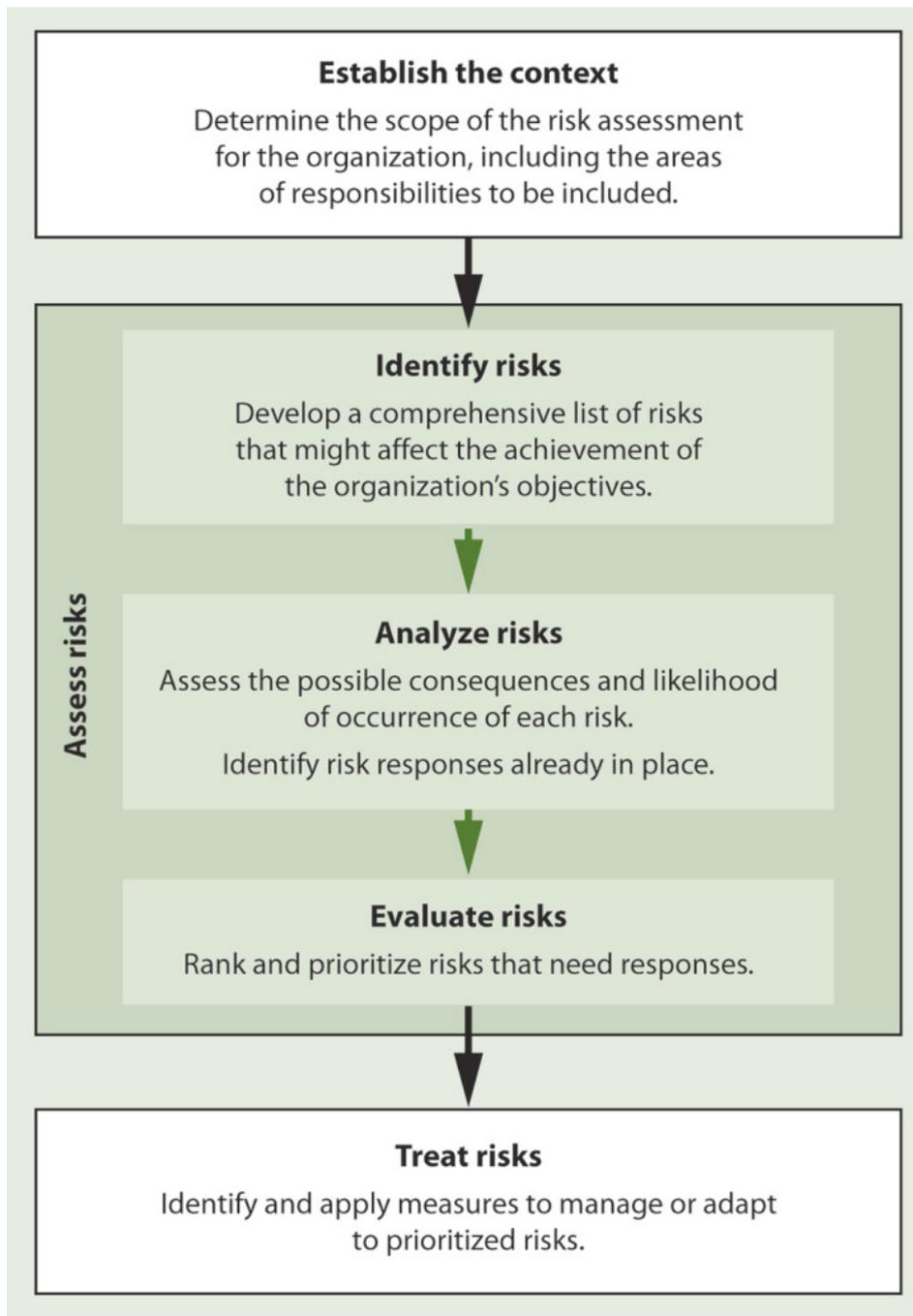
In 2018, the European Court of Auditors (ECA) issued a Floods Directive special report focused on progress in assessing risks from floods.²³ In response to the rising incidence of flooding, the European Union adopted in 2007 the Floods Directive. Under this framework, the ECA sought to determine whether flood prevention, protection, and preparedness under the Floods Directive were based on sound analysis and whether the approach employed was likely to be effective. In their analysis, the ECA used some components consistent with ERM; specifically, the ECA found that project ranking procedures should be more strongly linked to the priorities in the Flood Risk Management Plans (identifying and assessing risks). In particular, the report noted two cases of ranking based on objective criteria: (1) The Netherlands ranks projects using a matrix reflecting the severity of potential damage and the probability of infrastructure failure; and (2) one Spanish plan categorized areas of potentially significant flood risk on the basis of risks rather than hazards alone, meaning that the vulnerability of exposed areas was also taken into account.

CANADA'S FRAMEWORK FOR THE MANAGEMENT OF RISK

In August 2010, Canada's Treasury Board developed a Framework for the Management of Risk (see figure 11). The purpose of the framework was to provide guidance to deputy heads on the implementation of effective risk management practices at all levels of their organizations. This would support strategic priority setting and resource allocation, informed decisions with respect to risk tolerance, and improved results.

²³ European Court of Auditors, *Flood Directives: Progress Assessing Risks, While Planning and Implementation Need to Improve*, (Luxembourg: 2018).

Figure 11: Canada's Treasury Board's Framework for the Management of Risk



Source: Adapted from International Organization for Standardization ISO 31000:2009: Risk Management—Principles and Guidelines, and the Treasury Board's Framework for the Management of Risk. Auditor General of Canada, Commissioner of the Environment and Sustainable Development, *Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada. Report 2: Adapting to the Impacts of Climate Change: independent auditor's report*, (Ottawa, Canada: 2017).

In the fall 2017, the Office of the Auditor General of Canada—the Supreme Audit Institution of Canada—conducted an audit on climate change adaptation.²⁴ In the audit, the Office of Auditor General used the Treasury Board’s Framework for the Management of Risk as criteria in two findings (see figure 12).

Figure 12: Using Canada’s Treasury Board Framework for the Management of Risk As Criteria For an Audit on Climate Change Adaptation

Criteria	Departments and agencies are expected to be aware of the risks to their mandates and adapt their policies and practices based on their vulnerability assessments. This is consistent with the Treasury Board’s Framework for the Management of Risk
Findings	SAI Canada found that 5 of the 19 departments and agencies we examined assessed climate change risks in their areas of responsibility, incorporated them into their broader corporate risk management activities, and implemented measures to respond to them. Fourteen departments and agencies had not fully assessed their climate change risks.
Why Findings Matter	Understanding the potential risks of climate change is key to ensuring that federal government programs and services are resilient. Each federal organization must manage the risks that could affect its ability to deliver on its mandate as envisioned by the Federal Adaptation Policy Framework. Without a clear understanding of climate change risks, it is difficult to manage them properly. Without considering these risks, the federal government’s central agencies cannot effectively review policy and program proposals of other departments and agencies
	
Recommendation	These departments and agencies should identify, assess, prioritize, and address the climate change risks related to their areas of responsibility.

Source: Auditor General of Canada, Commissioner of the Environment and Sustainable Development, *Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada. Report 2: Adapting to the Impacts of Climate Change: independent auditor’s report*, (Ottawa, Canada: 2017).

GAO’S DISASTER RESILIENCE FRAMEWORK

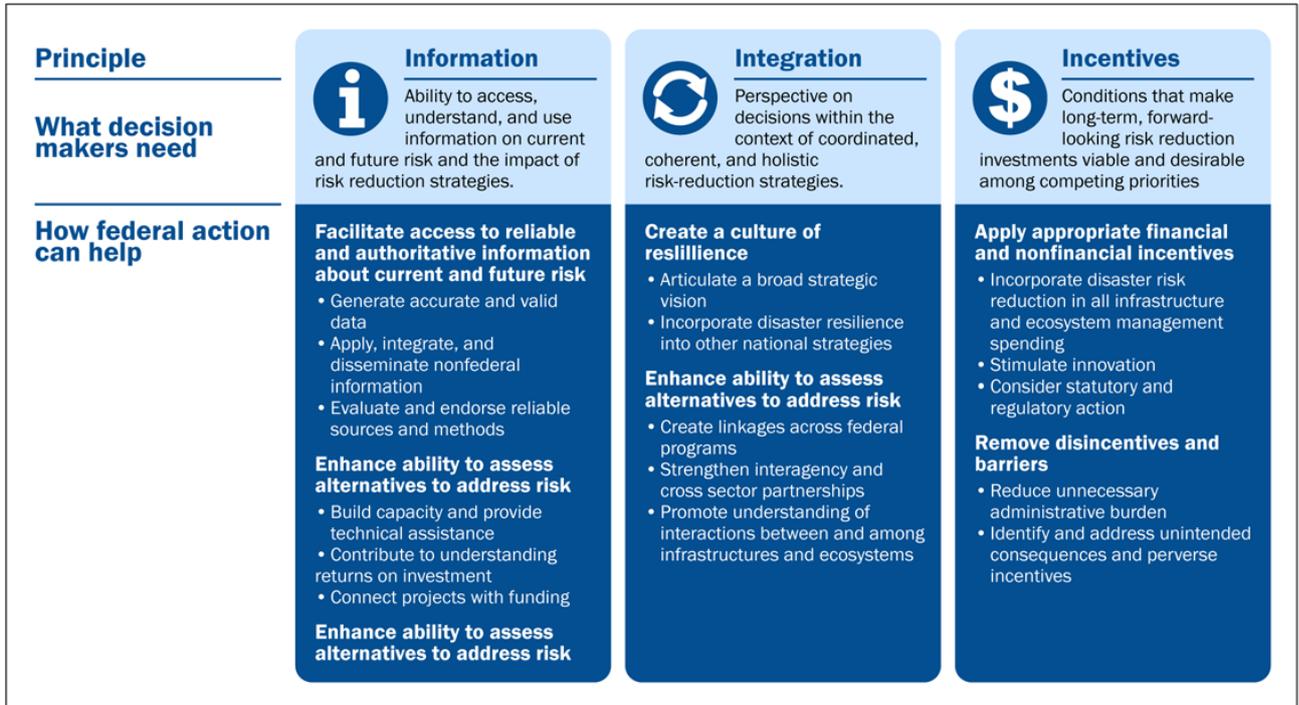
GAO has recognized the environment and disasters as one of five key sources of federal fiscal risk. Taking action to increase disaster resilience is perhaps the most promising option the federal government has to help reduce the fiscal exposure. Disaster resilience—a key facet of overall community, regional, and national resilience—refers largely to the potential for disaster risk reduction by altering the physical and built environment and protecting natural ecosystems with activities such as hazard mitigation and climate change adaptation with the goal of reducing future disaster losses.

The responsibility for increasing disaster resilience is shared across levels of government; the private, not-for-profit, and academic sectors; communities; and individuals. The federal government can design and deliver policy and financial incentives, and direct services to promote a climate of disaster resilience and help decision makers focus on increasing disaster resilience.

²⁴ Auditor General of Canada, Commissioner of the Environment and Sustainable Development, *Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada. Report 2: Adapting to the Impacts of Climate Change: independent auditor’s report*, (Ottawa, Canada: 2017).

The draft framework below, to be finalized in similar form early in 2019, presents key principles informing GAO’s work on disasters (see figure 13). These principles describe an ideal end-state for a culture of resilience—i.e., a systematic application of approaches, incentive systems, and knowledge development that align to promote a continuous and pervasive effort to maximize disaster-risk reduction opportunities. Although this ideal state may never be fully realized, evaluators, analysts, program officials, and policy makers may find these principles helpful for achieving incremental progress.

Figure 13: GAO’s Disaster Resilience Framework (Draft)



Source: GAO. | GAO-19-552SP

Chapter 7

Integrating Multiple Performance Audits to Assess High Level Goals

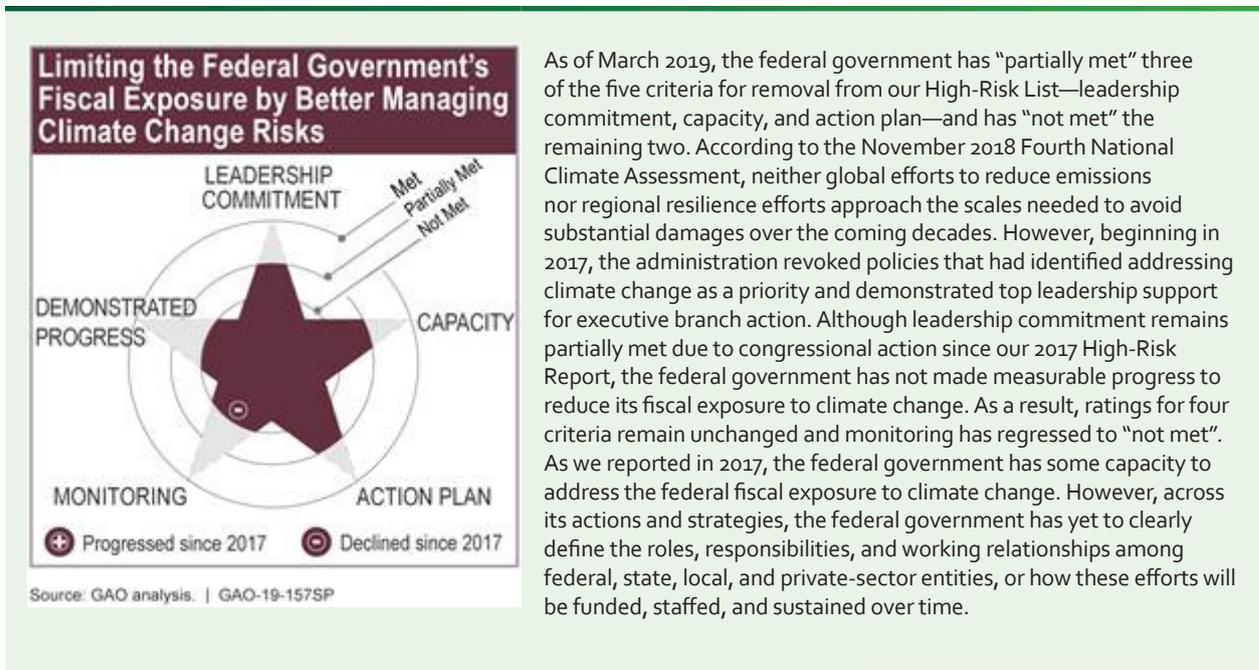
In this section, we present a framework for using individual performance audits to assess progress toward high-level goals related to SDG 13.1. GAO's High Risk series is an example of how SAs can integrate multiple performance audits of specific government initiatives into a greater body of work. In 1990, GAO began a program to report on government operations that it identified as "high risk," that is, government operations with greater vulnerabilities to fraud, waste, abuse, and mismanagement or the need for transformation to address economy, efficiency, or effectiveness challenges. Since then, GAO has reported on the status of progress addressing high-risk areas and has updated the High-Risk List. Overall, this program has served to identify and help resolve serious weaknesses in areas that involve substantial resources and provide critical services to the public.

GAO's experience has shown that key elements needed to make progress in high-risk areas include top-level attention by the administration, agency leaders well-versed in the five criteria for removing an area from the High-Risk List, and any needed congressional action. The five criteria for removing high-risk areas from the list are as follows:

1. Leadership Commitment: there exists demonstrated strong commitment and support from top leadership.
2. Capacity: an agency has the capacity (people and resources) to resolve the risk(s).
3. Action Plan: a corrective action plan exists that defines the root cause and solutions, and provides for substantially completing corrective measures, including steps necessary to implement solutions we recommended.
4. Monitoring: a program has been instituted to monitor and independently validate the effectiveness and sustainability of corrective measures.
5. Demonstrated Progress: There exists demonstrable progress in implementing corrective measures and in resolving the high-risk area.

For example, the section in GAO’s High Risk series titled *Limiting the Federal Government’s Fiscal Exposure by Better Managing Climate Change Risks* examines the federal government’s status and progress related to climate change risks (see figure 14).

Figure 14: 2019 High Risk List : Progress Criteria Ratings for Limiting the Federal Government’s Fiscal Exposure by Better Managing Climate Change Risks



As of March 2019, the federal government has “partially met” three of the five criteria for removal from our High-Risk List—leadership commitment, capacity, and action plan—and has “not met” the remaining two. According to the November 2018 Fourth National Climate Assessment, neither global efforts to reduce emissions nor regional resilience efforts approach the scales needed to avoid substantial damages over the coming decades. However, beginning in 2017, the administration revoked policies that had identified addressing climate change as a priority and demonstrated top leadership support for executive branch action. Although leadership commitment remains partially met due to congressional action since our 2017 High-Risk Report, the federal government has not made measurable progress to reduce its fiscal exposure to climate change. As a result, ratings for four criteria remain unchanged and monitoring has regressed to “not met”. As we reported in 2017, the federal government has some capacity to address the federal fiscal exposure to climate change. However, across its actions and strategies, the federal government has yet to clearly define the roles, responsibilities, and working relationships among federal, state, local, and private-sector entities, or how these efforts will be funded, staffed, and sustained over time.

Source: Government Accountability Office, *HIGH-RISK SERIES: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, GAO-19-157SP (Washington, D.C., United States: 2019).

To determine the federal government’s overall rating and status, GAO relies on a number of individual performance audits, many using some of the criteria outlined in Chapter VI of this document. A similar tool could help inform SAIs on whether their national governments are progressing toward the crosscutting high-level international goals defined by SDG 13.1 and the Sendai Framework. In such cases, individual performance audits could provide the building blocks for a broader audit framework that would reconcile high-level government goals and plans with necessarily more discreet and focused audits. As such, this is one way to use existing audits to form a bottom-up approach, rather than a top-down approach, to auditing SDGs.

Concluding Remarks

Climate-related hazards pose increasing financial risks to national governments around the world in the form of loss of life, costs to respond, and costs to rebuild, among other things. While critical, the areas of audit related to climate change and sustainable development goals are relatively new. This is an emerging area with few studies from which to draw best practices for planning audits. The SDGs and the Sendai Framework for Disaster Risk Reduction provide high-level targets to guide national governments, but they are generally too high level for SAIs to use as criteria for performance audits of specific government initiatives. This research paper aims to help SAIs understand how to apply existing criteria to future studies, which would enable the development of best practices going forward.

Appendices

APPENDIX I: ACRONYMS AND ABBREVIATIONS

ECA	European Court of Auditors
EPA	United States Environmental Protection Agency
ERM	Enterprise Risk Management
GAO	United States Government Accountability Office
IAEG-SDGs	UN Inter-Agency and Expert Group on SDG Indicators
INTOSAI	International Organisation of Supreme Audit Institutions
SAI	Supreme Audit Institution
SDG	Sustainable Development Goal
2030 Agenda	United Nation's 2030 Agenda for Sustainable Development
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WGEA	Working Group On Environmental Auditing

APPENDIX II: 17 SDG GOALS AND 169 ASSOCIATED TARGETS

Goal 1. End poverty in all its forms everywhere

- 1.1 by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day
- 1.2 by 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions

- 1.3 implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable
- 1.4 by 2030 ensure that all men and women, particularly the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership, and control over land and other forms of property, inheritance, natural resources, appropriate new technology, and financial services including microfinance
- 1.5 by 2030 build the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters
- 1.a ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation to provide adequate and predictable means for developing countries, in particular LDCs, to implement programmes and policies to end poverty in all its dimensions
- 1.b create sound policy frameworks, at national, regional and international levels, based on pro-poor and gender-sensitive development strategies to support accelerated investments in poverty eradication actions

Goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

- 2.1 by 2030 end hunger and ensure access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round
- 2.2 by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons
- 2.3 by 2030 double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment
- 2.4 by 2030 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality
- 2.5 by 2020 maintain genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge as internationally agreed
- 2.a increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, in particular in least developed countries

- 2.b correct and prevent trade restrictions and distortions in world agricultural markets including by the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round
- 2.c adopt measures to ensure the proper functioning of food commodity markets and their derivatives, and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

Goal 3. Ensure healthy lives and promote well-being for all at all ages

- 3.1 by 2030 reduce the global maternal mortality ratio to less than 70 per 100,000 live births
- 3.2 by 2030 end preventable deaths of newborns and under-five children
- 3.3 by 2030 end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, water-borne diseases, and other communicable diseases
- 3.4 by 2030 reduce by one-third pre-mature mortality from non-communicable diseases (NCDs) through prevention and treatment, and promote mental health and wellbeing
- 3.5 strengthen prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
- 3.6 by 2020 halve global deaths and injuries from road traffic accidents
- 3.7 by 2030 ensure universal access to sexual and reproductive health care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
- 3.8 achieve universal health coverage (UHC), including financial risk protection, access to quality essential health care services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all
- 3.9 by 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination
- 3.a strengthen implementation of the Framework Convention on Tobacco Control in all countries as appropriate
- 3.b support research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration which affirms the right of developing countries to use to the full the provisions in the TRIPS agreement regarding flexibilities to protect public health and, in particular, provide access to medicines for all
- 3.c increase substantially health financing and the recruitment, development and training and retention of the health workforce in developing countries, especially in LDCs and SIDS

- 3.d strengthen the capacity of all countries, particularly developing countries, for early warning, risk reduction, and management of national and global health risks.

Goal 4. Ensure inclusive and equitable quality education and promote life-long learning opportunities for all

- 4.1 by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes
- 4.2 by 2030 ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education
- 4.3 by 2030 ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university
- 4.4 by 2030, increase by x% the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship
- 4.5 by 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples, and children in vulnerable situations
- 4.6 by 2030 ensure that all youth and at least x% of adults, both men and women, achieve literacy and numeracy
- 4.7 by 2030 ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development
- 4.a build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all
- 4.b by 2020 expand by x% globally the number of scholarships for developing countries in particular LDCs, SIDS and African countries to enrol in higher education, including vocational training, ICT, technical, engineering and scientific programmes in developed countries and other developing countries
- 4.c by 2030 increase by x% the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially LDCs and SIDS

Goal 5. Achieve gender equality and empower all women and girls

- 5.1 end all forms of discrimination against all women and girls everywhere
- 5.2 eliminate all forms of violence against all women and girls in public and private spheres, including trafficking and sexual and other types of exploitation
- 5.3 eliminate all harmful practices, such as child, early and forced marriage and female genital mutilations

- 5.4 recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies, and the promotion of shared responsibility within the household and the family as nationally appropriate
- 5.5 ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life
- 5.6 ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the ICPD and the Beijing Platform for Action and the outcome documents of their review conferences
- 5.a undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance, and natural resources in accordance with national laws
- 5.b enhance the use of enabling technologies, in particular ICT, to promote women's empowerment
- 5.c adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels

Goal 6. Ensure availability and sustainable management of water and sanitation for all

- 6.1 by 2030, achieve universal and equitable access to safe and affordable drinking water for all
- 6.2 by 2030, achieve access to adequate and equitable sanitation and hygiene for all, and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
- 6.3 by 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and increasing recycling and safe reuse by x% globally
- 6.4 by 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity, and substantially reduce the number of people suffering from water scarcity
- 6.5 by 2030 implement integrated water resources management at all levels, including through transboundary cooperation as appropriate
- 6.6 by 2020 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
- 6.a by 2030, expand international cooperation and capacity-building support to developing countries in water and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies
- 6.b support and strengthen the participation of local communities for improving water and sanitation management

Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all

- 7.1 by 2030 ensure universal access to affordable, reliable, and modern energy services
- 7.2 increase substantially the share of renewable energy in the global energy mix by 2030
- 7.3 double the global rate of improvement in energy efficiency by 2030
- 7.a by 2030 enhance international cooperation to facilitate access to clean energy research and technologies, including renewable energy, energy efficiency, and advanced and cleaner fossil fuel technologies, and promote investment in energy infrastructure and clean energy technologies
- 7.b by 2030 expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, particularly LDCs and SIDS

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

- 8.1 sustain per capita economic growth in accordance with national circumstances, and in particular at least 7% per annum GDP growth in the least-developed countries
- 8.2 achieve higher levels of productivity of economies through diversification, technological upgrading and innovation, including through a focus on high value added and labour-intensive sectors
- 8.3 promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalization and growth of micro-, small- and medium-sized enterprises including through access to financial services
- 8.4 improve progressively through 2030 global resource efficiency in consumption and production, and endeavour to decouple economic growth from environmental degradation in accordance with the 10-year framework of programmes on sustainable consumption and production with developed countries taking the lead
- 8.5 by 2030 achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
- 8.6 by 2020 substantially reduce the proportion of youth not in employment, education or training
- 8.7 take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labour, eradicate forced labour, and by 2025 end child labour in all its forms including recruitment and use of child soldiers
- 8.8 protect labour rights and promote safe and secure working environments of all workers, including migrant workers, particularly women migrants, and those in precarious employment
- 8.9 by 2030 devise and implement policies to promote sustainable tourism which creates jobs, promotes local culture and products
- 8.10 strengthen the capacity of domestic financial institutions to encourage and to expand access to banking, insurance and financial services for all

- 8.a increase Aid for Trade support for developing countries, particularly LDCs, including through the Enhanced Integrated Framework for LDCs
- 8.b by 2020 develop and operationalize a global strategy for youth employment and implement the ILO Global Jobs Pact

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

- 9.1 develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all
- 9.2 promote inclusive and sustainable industrialization, and by 2030 raise significantly industry's share of employment and GDP in line with national circumstances, and double its share in LDCs
- 9.3 increase the access of small-scale industrial and other enterprises, particularly in developing countries, to financial services including affordable credit and their integration into value chains and markets
- 9.4 by 2030 upgrade infrastructure and retrofit industries to make them sustainable, with increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, all countries taking action in accordance with their respective capabilities
- 9.5 enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, particularly developing countries, including by 2030 encouraging innovation and increasing the number of R&D workers per one million people by x% and public and private R&D spending
- 9.a facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, LDCs, LLDCs and SIDS
- 9.b support domestic technology development, research and innovation in developing countries including by ensuring a conducive policy environment for inter alia industrial diversification and value addition to commodities
- 9.c significantly increase access to ICT and strive to provide universal and affordable access to internet in LDCs by 2020

Goal 10. Reduce inequality within and among countries

- 10.1 by 2030 progressively achieve and sustain income growth of the bottom 40% of the population at a rate higher than the national average
- 10.2 by 2030 empower and promote the social, economic and political inclusion of all irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status
- 10.3 ensure equal opportunity and reduce inequalities of outcome, including through eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and actions in this regard

- 10.4 adopt policies especially fiscal, wage, and social protection policies and progressively achieve greater equality
- 10.5 improve regulation and monitoring of global financial markets and institutions and strengthen implementation of such regulations
- 10.6 ensure enhanced representation and voice of developing countries in decision making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions
- 10.7 facilitate orderly, safe, regular and responsible migration and mobility of people, including through implementation of planned and well-managed migration policies
- 10.a implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with WTO agreements
- 10.b encourage ODA and financial flows, including foreign direct investment, to states where the need is greatest, in particular LDCs, African countries, SIDS, and LLDCs, in accordance with their national plans and programmes
- 10.c by 2030, reduce to less than 3% the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5%

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

- 11.1 by 2030, ensure access for all to adequate, safe and affordable housing and basic services, and upgrade slums
- 11.2 by 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
- 11.3 by 2030 enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management in all countries
- 11.4 strengthen efforts to protect and safeguard the world's cultural and natural heritage
- 11.5 by 2030 significantly reduce the number of deaths and the number of affected people and decrease by y% the economic losses relative to GDP caused by disasters, including water-related disasters, with the focus on protecting the poor and people in vulnerable situations
- 11.6 by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, municipal and other waste management
- 11.7 by 2030, provide universal access to safe, inclusive and accessible, green and public spaces, particularly for women and children, older persons and persons with disabilities
- 11.a support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning

- 11.b by 2020, increase by x% the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, develop and implement in line with the forthcoming Hyogo Framework holistic disaster risk management at all levels
- 11.c support least developed countries, including through financial and technical assistance, for sustainable and resilient buildings utilizing local materials

Goal 12. Ensure sustainable consumption and production patterns

- 12.1 implement the 10-Year Framework of Programmes on sustainable consumption and production (10YFP), all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries
- 12.2 by 2030 achieve sustainable management and efficient use of natural resources
- 12.3 by 2030 halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains including post-harvest losses
- 12.4 by 2020 achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with agreed international frameworks and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment
- 12.5 by 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse
- 12.6 encourage companies, especially large and trans-national companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
- 12.7 promote public procurement practices that are sustainable in accordance with national policies and priorities
- 12.8 by 2030 ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature
- 12.a support developing countries to strengthen their scientific and technological capacities to move towards more sustainable patterns of consumption and production
- 12.b develop and implement tools to monitor sustainable development impacts for sustainable tourism which creates jobs, promotes local culture and products
- 12.c rationalize inefficient fossil fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Goal 13. Take urgent action to combat climate change and its impacts

*Acknowledging that the UN Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

- 13.1 strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
- 13.2 integrate climate change measures into national policies, strategies, and planning
- 13.3 improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning
- 13.a implement the commitment undertaken by developed country Parties to the UN Framework Convention on Climate Change to a goal of mobilizing jointly USD100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible
- 13.b Promote mechanisms for raising capacities for effective climate change related planning and management, in LDCs, including focusing on women, youth, local and marginalized communities

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

- 14.1 by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution
- 14.2 by 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration, to achieve healthy and productive oceans
- 14.3 minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels
- 14.4 by 2020, effectively regulate harvesting, and end overfishing, illegal, unreported and unregulated (IUU) fishing and destructive fishing practices and implement science-based management plans, to restore fish stocks in the shortest time feasible at least to levels that can produce maximum sustainable yield as determined by their biological characteristics
- 14.5 by 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on best available scientific information
- 14.6 by 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to IUU fishing, and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the WTO fisheries subsidies negotiation *

- 14.7 by 2030 increase the economic benefits to SIDS and LDCs from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism
- 14.a increase scientific knowledge, develop research capacities and transfer marine technology taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular SIDS and LDCs
- 14.b provide access of small-scale artisanal fishers to marine resources and markets
- 14.c ensure the full implementation of international law, as reflected in UN Convention on the Law of the Sea for states parties to it, including, where applicable, existing regional and international regimes for the conservation and sustainable use of oceans and their resources by their parties

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

- 15.1 by 2020 ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
- 15.2 by 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and increase afforestation and reforestation by x% globally
- 15.3 by 2020, combat desertification, and restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world
- 15.4 by 2030 ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide benefits which are essential for sustainable development
- 15.5 take urgent and significant action to reduce degradation of natural habitat, halt the loss of biodiversity, and by 2020 protect and prevent the extinction of threatened species
- 15.6 ensure fair and equitable sharing of the benefits arising from the utilization of genetic resources, and promote appropriate access to genetic resources
- 15.7 take urgent action to end poaching and trafficking of protected species of flora and fauna, and address both demand and supply of illegal wildlife products
- 15.8 by 2020 introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems, and control or eradicate the priority species

- 15.9 by 2020, integrate ecosystems and biodiversity values into national and local planning, development processes and poverty reduction strategies, and accounts
- 15.a mobilize and significantly increase from all sources financial resources to conserve and sustainably use biodiversity and ecosystems
- 15.b mobilize significantly resources from all sources and at all levels to finance sustainable forest management, and provide adequate incentives to developing countries to advance sustainable forest management, including for conservation and reforestation
- 15.c enhance global support to efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

- 16.1 significantly reduce all forms of violence and related death rates everywhere
- 16.2 end abuse, exploitation, trafficking and all forms of violence and torture against children
- 16.3 promote the rule of law at the national and international levels, and ensure equal access to justice for all
- 16.4 by 2030 significantly reduce illicit financial and arms flows, strengthen recovery and return of stolen assets, and combat all forms of organized crime
- 16.5 substantially reduce corruption and bribery in all its forms
- 16.6 develop effective, accountable and transparent institutions at all levels
- 16.7 ensure responsive, inclusive, participatory and representative decision-making at all levels
- 16.8 broaden and strengthen the participation of developing countries in the institutions of global governance
- 16.9 by 2030 provide legal identity for all including birth registration
- 16.10 ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements
- 16.a strengthen relevant national institutions, including through international cooperation, for building capacities at all levels, in particular in developing countries, for preventing violence and combating terrorism and crime
- 16.b promote and enforce non-discriminatory laws and policies for sustainable development

Goal 17. Revitalize the global partnership for sustainable development finance

- 17.1 strengthen domestic resource mobilization, including through international support to developing countries to improve domestic capacity for tax and other revenue collection
- 17.2 developed countries to implement fully their ODA commitments, including to provide 0.7% of GNI in ODA to developing countries of which 0.15-0.20% to least-developed countries
- 17.3 mobilize additional financial resources for developing countries from multiple sources
- 17.4 assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries (HIPC) to reduce debt distress
- 17.5 adopt and implement investment promotion regimes for LDCs

Technology

- 17.6 enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation, and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, particularly at UN level, and through a global technology facilitation mechanism when agreed
- 17.7 promote development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed
- 17.8 fully operationalize the Technology Bank and STI (Science, Technology and Innovation) capacity building mechanism for LDCs by 2017, and enhance the use of enabling technologies in particular ICT

Capacity building

- 17.9 enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all sustainable development goals, including through North-South, South-South, and triangular cooperation

Trade

- 17.10 promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the WTO including through the conclusion of negotiations within its Doha Development Agenda
- 17.11 increase significantly the exports of developing countries, in particular with a view to doubling the LDC share of global exports by 2020
- 17.12 realize timely implementation of duty-free, quota-free market access on a lasting basis for all least developed countries consistent with WTO decisions, including through ensuring that preferential rules of origin applicable to imports from LDCs are transparent and simple, and contribute to facilitating market access

Systemic issues

Policy and institutional coherence

- 17.13 enhance global macroeconomic stability including through policy coordination and policy coherence
- 17.14 enhance policy coherence for sustainable development
- 17.15 respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development

Multi-stakeholder partnerships

- 17.16 enhance the global partnership for sustainable development complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technologies and financial resources to support the achievement of sustainable development goals in all countries, particularly developing countries
- 17.17 encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships

Data, monitoring and accountability

- 17.18 by 2020, enhance capacity building support to developing countries, including for LDCs and SIDS, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts
- 17.19 by 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement GDP, and support statistical capacity building in developing countries

APPENDIX III: EXAMPLES OF AUDITS

We participated in the WGEA mini-survey of SAIs and asked questions related to audits relevant to SDG 13.1. We found that this is an emerging area for SAIs with little work done thus far. No holistic framework exists for how to audit SDG 13.1 at the national level and thus that is the intent of this research paper. Nonetheless, some SAIs have begun to audit national programs related to the sustainable development goals and conducted individual audits of related programs. Some examples, based on responses to our mini survey, are outlined in this appendix. To augment these efforts in the future, we recommend WGEA establish an ongoing collection of relevant frameworks and specific audit examples.

SAI Afghanistan Performance Audit on the Emergency Response and Relief Aid System Of State Minister in Disaster Management

In 2017, SAI Afghanistan conducted a Performance Audit Report on Emergency Response and Relief Aid System of State Minister in Disaster Management. The audit was carried out to assess the effectiveness of the Emergency Response and Relief Aid System of the state Minister of Disaster Management. It found that the assessment survey and evaluation were not carried out according to the manual developed by the state Minister

of Disaster Management and no sufficient and reliable supporting documents related to emergency responses and process of relief aid distribution. This resulted in the improper and inefficient distribution of relief aid and irregularities in receiving the distributed aid relief by the affected communities. The study also found that coordination between the Provincial Disaster Management Committees, Provincial Emergency Response Committee, and State Minister in disaster management was weak.

In order to ensure that the relief aid and emergency funds are appropriately managed and effectively distributed to the affected victims, SAI Afghanistan recommended that the State Minister in Disaster Management build the capacity of the Directorate of Emergency Response and Operation Center to implement the survey manual while conducting survey and evaluation assessment on the spot.

SAI Czech Republic Report on Drought Mitigation and Flood Prevention Programs

In late 2018, SAI Czech Republic will begin an audit of measures the country has implemented to mitigate the negative impacts of drought and water scarcity on agriculture. The audit will focus on the ability of the agriculture and land management sectors to manage landscape retention capabilities. The country's insufficient ability to retain water is a serious problem that will be exacerbated by climate change and therefore, water retention and management is identified as a priority area in the country's National Adaptation Strategy. In 2019, the SAI Czech Republic will continue with an audit of funds and measures for Flood Prevention Programs.

SAI Mexico Audits Related to the Government's Ability to Foresee and Prevent Damage from Natural Phenomena

Mexico's National Program for Civil Protection 2014-2018, along with the Sectoral Governance Program 2013-2018 and the National Development Plan 2013-2018, established the objective of Promoting Preventive Action in Comprehensive Risk Management to reduce the effects of natural phenomena exacerbated by climate change. In 2010, the SAI of Mexico conducted three audits related to this objective, focusing on the following: the "Civil Protection" program, under the responsibility of the Secretariat of the Interior (SEGOB); the National Center for Disaster Prevention (CENAPRED); and the National Water Commission (CONAGUA). SAI Mexico concluded that SEGOB did not reasonably comply with the objective of foreseeing and preventing damage caused by natural phenomena to preserve physical integrity and people's assets, as required. In addition, they found that the civil protection actions and policies implemented by the General Coordination of Civil Protection to foresee and prevent risks due to natural phenomena were insufficient to mitigate the negative effects of the geological and hydrometeorological incidents that took place in 2005 through 2009.

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²⁵ Note: we plan to update this citation to the updated 2019 high risk list when it comes out.



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