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UN Office for Disaster Risk Reduction

SENDAI FRAMEWORK

FOR DISASTER RISK REDUCTION 2015-2030



Promoting Synergy and Alignment

Between Climate Change
Adaptation and Disaster Risk
Reduction in the Context of
National Adaptation Plans

A Supplement to the UNFCCC NAP Technical
Guidelines



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In 2021, the supplement was updated to keep it relevant, and includes new literature, good practices and methodologies developed since 2018. It now also addresses some of the key gaps and needs identified by the Least Developed Countries Expert Group (LEG) in its March 2020 report. The document received a final review by Ricardo Mena, Loretta Hieber Girardet, Animesh Kumar and Donna Mitzi Lagdameo (UNDRR).

ABBREVIATIONS AND ACRONYMS

CCA	Climate Change Adaptation
CBA	Cost-benefit analysis
COP	Conference of the Parties
EU	European Union
CAPRA	Central America Probabilistic Risk Assessment
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
FAO	Food and Agriculture Organization
FEMA	Federal Emergency Management Agency
FONDEN	Fideicomiso Fondo de Desastres Naturales
HFA	Hyogo Framework for Action
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel on Climate Change
LDCs	Least developed countries
LEG	Least Developed Countries Expert Group
NAP	National Adaptation Plan
SDG	Sustainable Development Goals
SFM	Sendai Framework Monitoring
SREX	Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation
UNDRR	United Nations Office for Disaster Risk Reduction (formerly known as UNISDR)
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UNDESA	United Nations Department of Economic and Social Affairs

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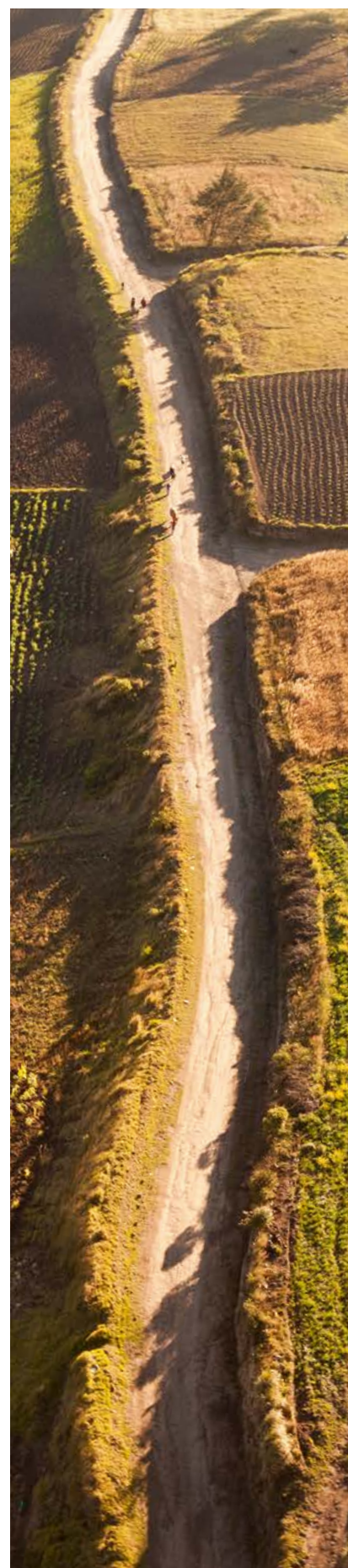
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OVERVIEW

When addressing and managing climate and disaster risks, strengthening synergies between climate change adaptation (CCA) and disaster risk reduction (DRR) is vital. This supplement to the UNFCCC National Adaptation Plan (NAP) Technical Guidelines^{1,2}, provides practical recommendations to guide NAP technical teams and focal points on how to strengthen and better promote synergy and coherence between CCA and DRR, including within broader national development planning processes and implementation.

The table below provides an overview of key benefits, commonalities, obstacles and pathways for more integrated approaches through the process of formulating and implementing the National Adaptation Plans.

<p>Key benefits of bringing DRR and CCA together in policy and practice</p>	<ul style="list-style-type: none"> • <i>More effective policies and investments that address existing and reduce future risks, and enable smoother alignment of parallel plans and policies.</i> • <i>More efficient use of capacities and financial resources.</i> • <i>Advances technical knowledge and expertise in assessing, understanding, reducing and managing risks, in terms of both climate and non-climate risks, thereby increasing effectiveness and sustainability of both DRR and CCA measures.</i> • <i>Enhancing actions to better adapt to the climate variability and change, and reduce risks, including through disaster preparedness and contingency plans.</i>
<p>Commonalities</p>	<ul style="list-style-type: none"> • <i>Both DRR and CCA are key to the achievement of the Sustainable Development Goals.</i> • <i>Risk and uncertainty are common to both DRR and CCA.</i> • <i>Risk components (hazards, exposure, vulnerabilities, capacities and risk drivers) should be understood in order to design effective measures.</i> • <i>Complementarity between planned, implemented and contingency measures to deal with the full spectrum of risk.</i> • <i>Risk governance is the main enabling element for achieving the Sendai Targets and the Sustainable Development Goals</i>
<p>Roots of existing separation</p>	<ul style="list-style-type: none"> • <i>Lack of clear understanding on the respective focus and approaches of DRR and CCA.</i> • <i>Housed under different multilateral agreements, each with its own modalities and procedures for support and implementation.</i> • <i>Difference in the institutional mechanisms for leading, coordinating, implementing and monitoring.</i> • <i>Difference in the streams and levels of financing available at national and international levels.</i> • <i>Difference in understanding of the spatial scale of impact and time horizon of measures.</i>
<p>Pathways to coherence</p>	<ul style="list-style-type: none"> • <i>Developing capacities for national policy development and implementation that promote coherence and synergy between DRR and CCA, including strengthening leadership and sharing best practices.</i> • <i>Applying comprehensive disaster and climate risk management that spans the full range of risk due to climate and non-climatic hazards.</i> • <i>Understanding how climate variability and change result in disaster risks, and how disaster risk affects adaptation.</i> • <i>Developing financing strategies for investments and financing that cover the full range of risk, piecing together different windows for segments of that risk.</i> • <i>Selecting co-efficient adaptation and risk management measures in a coordinated manner.</i> • <i>Coordinating data collection, assessment, implementation, monitoring and evaluation.</i>

1 The UNFCCC Technical Guidelines for the NAP process are available at at: <http://www4.unfccc.int/nap/Guidelines/Pages/Technical-guidelines.aspx>

2 Other supplementary material to the UNFCCC NAP technical guideline is available at: <http://www4.unfccc.int/nap/Guidelines/Pages/Supplements.aspx>

An aerial photograph of a vast, lush green rice paddy field. The field is divided into numerous rectangular plots by narrow, winding paths. In the upper right quadrant, a small, simple house with a corrugated metal roof is visible. Another similar house is located in the lower center of the frame. The overall scene is a vibrant, textured expanse of green under bright, natural light.

1

INTRODUCTION

- MOTIVATION FOR SEEKING SYNERGY BETWEEN CCA AND DRR
- OBSTACLES FOR CCA AND DRR COHERENCE
- ABOUT THIS GUIDE
- THE AUDIENCE
- THE STRUCTURE

INTRODUCTION

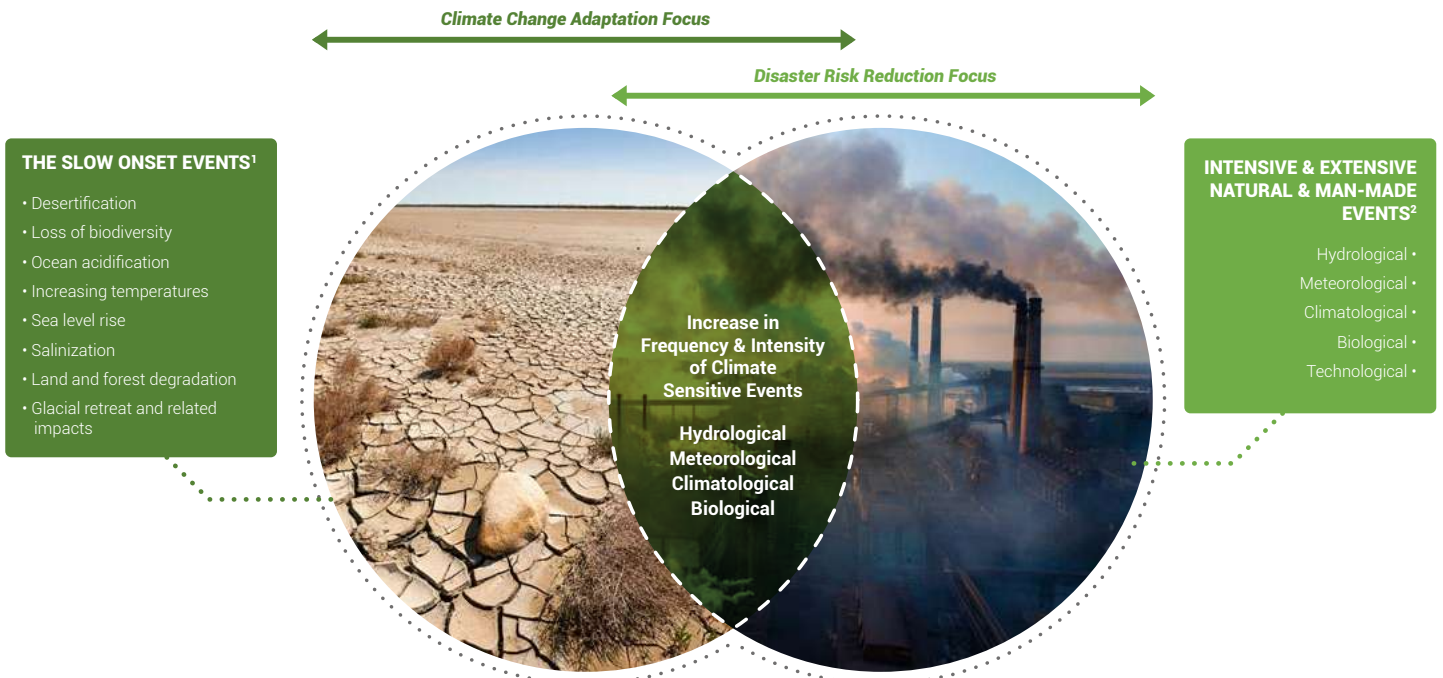
MOTIVATION FOR SEEKING SYNERGY BETWEEN CCA AND DRR

The impacts of climate change are already being felt in many regions of the globe and they pose new, evolving and significant challenges to achieving sustainable development. Climate change is already impacting the nature of weather-related hazards, leading to more frequent and intense extreme events. It is expected to further exacerbate both slow-onset and extreme weather events in the coming decades, leading to losses that can potentially erase development gains in various sectors, dragging millions of people further back into poverty and increase the number of humanitarian crises.³ Climate change adaptation (CCA) and disaster risk reduction (DRR) are key approaches that help governments and communities adapt to these impacts and disaster and effectively reduce and manage risks.

Building resilience of people, economies and natural resources to the impacts of slow-onset and extreme weather and climate events is the common ground between climate change adaptation efforts and disaster risk reduction efforts.

Climate and disaster risks are the result of interaction between hazards and the exposed assets with their vulnerabilities and coping capacities. Weather and climate related hazards, both slow onset and extreme events, are the common hazards between the two, while disaster risk also includes additional geological, environmental, biological, and technological hazards⁴ (see **Figure 1**). Climate change also has an impact on exposure and vulnerabilities, which would lead to a change to risk levels even for non-climate hazards.⁵ The process of developing policies and investing in CCA and DRR strategies have similar approaches, common challenges and complementary advantages for governance, financing, information and data analysis, capacity development and monitoring.

Figure 1. Common and uncommon hazards that are the focus of CCA and DRR



¹ As defined by COP decision 1/CP.16

² As defined by the Sendai Framework for DRR

³ IPCC-SREX and IPCC Fifth Assessment Report

⁴ The Sendai Framework for Disaster Risk Reduction (2015-2033), Paragraph 15, page 11

⁵ For example, migration from coastal areas due to sea level rise and settling in hilly zones susceptible to landslides would lead to an increase in landslide risk.

BOX 1. DEFINITION OF CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION

Climate Change Adaptation: The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.

(IPCC Working Group II Fifth Assessment Report, AR5, IPCC, 2014a)

Disaster Risk Reduction: Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.

(Source: Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction, UNISDR, 2016)

Two international agreements have set goals and guidance for nations to conduct CCA and DRR. The Paris Agreement established a global goal of “enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change,” while the Sendai Framework for Disaster Risk Reduction 2015-2030 aims to strengthen resilience and reduce disaster risk through addressing exposure and vulnerability to natural and man-made hazards.⁶ Resilience building is the shared foundation of the **Paris Agreement** and the **Sendai Framework for DRR**⁷ as well as the **2030 Agenda for Sustainable Development** (SDG 2030). Coherent and mutually reinforcing efforts to implement these international agreements are among the most sensible approaches for strengthening the resilience of communities and nations.

Together the Paris Agreement, Sendai Framework and SDG 2030 urge the following:

- **Attention to all risks** that communities are facing around the world.
- **Calls for engagement and contributions** from the whole of society.
- **Guidance of public and private investments** towards greater resilience in all sectors.

The question of coordination, integration and synergies between CCA and DRR has been on the forefront of many international discussions in the recent years, with progressive attention and interest conceptually and in practice at national and sub-national levels. **Box 2** provides an overview of how the SDG 2030, the Paris Agreement, and the Sendai Framework are calling

for stronger coherence between CCA, DRR and with development planning and investments.

The three global agreements refer to their respective objectives and mandates for sustainable development, disaster risk reduction and climate change action. However, **these different themes are inextricably linked with one another** and the overlapping areas have gradually gained prominence, especially over the last decade.

A considerable body of work of academic and policy-focused materials have been produced with useful analyses that identify links, similarities and differences between CCA, DRR, and development. **Annex I** provides a non-exhaustive list of resources on this topic.

In summary, **potential key benefits of enhancing coherence and synergies between CCA and DRR** are⁸:

- More effective policies and investments in CCA and DRR including integration of the two in development plans and policies.
- More efficient use of capacities and financial resources.
- Advancing technical knowledge and expertise in assessing, understanding, and managing risk both climate and non-climate risk.
- Enhanced disaster preparedness and response planning. 🌱

⁶ United Nations System, *UN System Strategic Approach on Climate Change Action* (Geneva, 2017).

⁷ The Sendai Framework for Disaster Risk Reduction 2015-2030 is a voluntary, non-binding agreement that was adopted by member states on March 18, 2015 and endorsed by the UN General Assembly on May 15, 2015

⁸ European Environment Agency, *Climate Change Adaptation and Disaster Risk Reduction in Europe: Enhancing coherence of the knowledge base, policies and practices*, EEA Report No 15/2017, (Luxembourg, Publications Office of the European Union, 2017).



BOX 2. CALLS FOR BUILDING RESILIENCE THROUGH INTEGRATED APPROACHES IN SDG 2030, THE PARIS AGREEMENT, AND THE SENDAI FRAMEWORK FOR DRR

Transforming our world: the 2030 Agenda for Sustainable Development (2015)

"This Agenda is a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. The 17 Sustainable Development Goals and 169 targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet."

Achievement of many of the sustainable development goals would require attention to potential negative impacts from various hazards and long-term impacts of climate change. Below are a few of the goals that would benefit more directly from incorporating disaster risk management and climate change adaptation into planning and investments.

Goal 1. End poverty in all its forms everywhere

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.

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

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.

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

3.9 By 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

3.D Strengthen the capacity of all countries in particular developing countries, for early warning, risk reduction and management of national and global health risks

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

9.A Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

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

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 promoting the poor and people in vulnerable situations

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

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

17.4 Enhance policy coherence for sustainable development

For monitoring progress in achievement of Goals 1, 11 and 13 governments have adopted the same indicators that were agreed through the Open-Ended Intergovernmental Expert Working Group on Indicators and Terminology for Disaster Risk Reduction.



The Paris Agreement (2015)

"The agreement sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C. In parallel to mitigation provisions, collective, long-term adaptation goals are included in the Agreement, and countries must report on their adaptation goals focus on enhancing adaptive capacity, increasing resilience, and limiting vulnerability."

Paragraph 3. Parties should enhance understanding, action and support, including through the Warsaw International Mechanism, as appropriate, on a cooperative and facilitative basis with respect to loss and damage associated with the adverse effects of climate change.

Paragraph 4. Accordingly, areas of cooperation and facilitation to enhance understanding, action and support may include:

- (a) Early warning systems.
- (b) Emergency preparedness.
- (c) Slow onset events.
- (d) Events that may involve irreversible and permanent loss and damage.
- (e) Comprehensive risk assessment and management.
- (f) Risk insurance facilities, climate risk pooling and other insurance solutions.
- (g) Non-economic losses; and
- (h) Resilience of communities, livelihoods and ecosystems.

Sendai Framework for Disaster Risk Reduction (2015)

Expected outcome: *"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."*

Scope and Purpose: *"Aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors"*

Paragraph 15. The framework will apply "to the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters".

Paragraph 13. Addressing climate change as one of the drivers of disaster risk, while respecting the mandate of the United Nations Framework Convention on Climate Change, represents an opportunity to reduce disaster risk in a meaningful and coherent manner throughout the interrelated intergovernmental processes.

Paragraph 25. (b) Promote the conduct of comprehensive surveys on multi-hazard disaster risks and the development of regional disaster risk assessments and maps, including climate change scenarios.



OBSTACLES FOR CCA AND DRR COHERENCE

While it is widely recognized that climate and disaster resilience should form an integral part of national strategies and development programs, progress towards comprehensive climate and disaster risk management has been slow. It has been more in the format of stand-alone projects and far less as national or local overarching development strategy and planning. Analyses of these early experiences show that it remains a major challenge to reconcile the policy arenas of CCA and DRR as well as climate change mitigation, economic growth and sustainable development.⁹

It remains a major challenge to reconcile the policy arenas of CCA and DRR as well as climate change mitigation, economic growth and sustainable development

The perception that the focus is different

There is a perception that DRR is only focused on disaster preparedness and response planning in short and mid-term. The DRR practice has slowly evolved and with the Sendai Framework for DRR it now officially focuses on disaster risk management with short-, mid- and long-term view. This includes ensuring new development is risk informed and does not produce new risks in the long-term.

Different origins

DRR originated from disaster management and disaster risk management, which included actions, linked to disaster response, which means the concepts have grown out of historical, cultural, and practical experiences in a mostly bottom-up direction. CCA has originated and grown within scientific bodies and started with a top-down approach.

Different institutional mechanisms at the national level

Today in most countries the national civil defence or national disaster (risk) management agencies are under the Ministry of Interior, Ministry of Defence or on some occasions Ministry of Development are mandated to lead DRR, while the Ministry of Environment or a newly created Climate Change Office usually lead CCA efforts at the national level. While the coordination mechanisms for CCA and DRR include representatives from a wide range of agencies, the individuals representing them normally come from different parts of the same organizations.

The ongoing efforts by countries to develop and implement National Adaptation Plans (NAPs), as well as developing and/or updating National DRR Strategies provide a unique opportunity for countries to take a systematic approach to accelerate the common goal of achieving climate and disaster resilience in development.



⁹ Stockholm Environment Institute (SEI). *Climate change and Disaster Risk Reduction, Background Paper prepared for the 2015 Global Assessment Report on Disaster Risk Reduction*, (Geneva, UNISDR, 2014)



ABOUT THIS GUIDE

This supplement focuses particularly on the opportunities that the National Adaptation Plan (NAP) process provides to national authorities and stakeholders for integrating risk-centred approaches and in creating synergies and effective connections with disaster risk reduction efforts. It should be used in conjunction with the NAP guidelines¹⁰ as it uses the four elements outlined in that document as its basis.

It was also developed to foster better understanding of the process to formulate and implement NAPs (NAP process) and to identify synergies with National DRR Strategies, with the end view of achieving resilient development. The supplementary guide, thus, also helps integrate climate and disaster risks in national planning processes.

In 2017, the Technical Expert Meeting on Adaptation (TEM-A) focused on “Integrating Climate Change Adaptation with The Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction.” The event was organized jointly by the Subsidiary Bodies and the Adaptation Committee of the UNFCCC and guided by the High-Level Climate Champions. The list of the opportunities and options identified in that meeting (see **Box 3**) is an excellent summary of the key issues that are elaborated in this document. ↻

This guide should be used in conjunction with the NAPs guideline as it uses the four elements outlined in that document as its basis.



¹⁰ Least Developed Countries Expert Group, *National Adaptation Plans. Technical guidelines for the national adaptation plan process*, (Bonn, Germany, UNFCCC secretariat, 2012). Available online at: <http://unfccc.int/NAP>



BOX 3. OPPORTUNITIES AND OPTIONS FOR INTEGRATING CLIMATE CHANGE ADAPTATION WITH THE SUSTAINABLE DEVELOPMENT GOALS AND THE SENDAI FRAMEWORK FOR DISASTER RISK REDUCTION 2015–2030

The Technical Expert Meeting on Adaptation which took place on 16-17 May 2017 in Bonn, Germany in conjunction with the forty-sixth sessions of subsidiary bodies focused on exploring opportunities and options for integration adaptation with SDGs and the Sendai Framework. The following are the key recommendations:

- **Integrating adaptation with the SDGs and the Sendai Framework** can be very beneficial for building resilience comprehensively across societies. While maintaining the autonomy of each of the post-2015 frameworks, improved coherence of action to implement the three frameworks can save money and time, enhance efficiency and further enable adaptation action.
- There are **many opportunities to support further policy integration between adaptation, sustainable development and disaster risk reduction**, owing in part to the common themes, scopes and objectives of the three global agendas. Both “resilience” and “ecosystems” can act as core concepts for motivating such integration. Actors, including state and non-state, operating across multiple sectors and scales ranging from local to global, can facilitate policy coherence, and vulnerable people and communities can benefit from and initiate effective bottom-up, locally driven solutions that contribute to multiple policy outcomes simultaneously.
- **Unprecedented levels of coordination and coherence** will be needed. Building the capacity for this will help to clarify roles and responsibilities and to encourage partnerships among a wide range of actors.
- **The availability of data, including climate and socioeconomic data, and its resolution** remain challenging, especially in Africa. Better data management, more informed policymaking and capacity-building are also needed.
- **The process to formulate and implement NAPs** can effectively support the implementation of enhanced adaptation action and the development of integrated approaches to adaptation, sustainable development and disaster risk reduction, thanks in part to the demonstrated success of NAPs as a planning instrument, the resources available for support, along with their iterative nature and flexible, nationally driven format.
- **Adequate, sustainable support for adaptation efforts from public, private, international and national sources** alike is crucial. Accessing finance and technology development and transfer and capacity building support are also critical, particularly for developing countries.

Source: Technical Paper by UNFCCC Secretariat, 2017

THE AUDIENCE

This guidance note is meant for the national authorities leading the process of developing and/or updating the NAP as well as all actors and stakeholders contributing to development of the NAP, especially in the least developed countries (LDCs). These practitioners are already familiar with the NAP Technical Guidelines developed by the Least Developed Countries Expert Group (LEG) and have been seeking additional inputs for integrating risk-centred approaches, related DRR good practices in developing and implementing NAPs.

The document can also be used by disaster risk management authorities to better understand the process to formulate and implement NAPs and synergies with DRR strategy design and therefore provide support and contribute to their development.

This guidance also outlines some considerations that can be taken by planning authorities (e.g., ministries of planning, finance, etc.) in national planning processes to comprehensively address climate and disaster risks within development planning and effectively shape resilient development. 🌱

THE STRUCTURE

With the aim of further facilitating the use of this guidance note, the document includes both conceptual content and practical instructions under three main sections:

- **Background:** This section provides information about the NAP and DRR strategy objectives and processes. Insight on the commonalities of CCA and DRR is also included.
- **Pathways to Build Connection and Coherence:** This section lists and elaborates on the key items that can be used as pathways for connecting with DRR.
- **A checklist for ensuring the NAP is in coherence with DRR:** This section aims at providing a practical and flexible instruction by listing the questions to be considered under each of the four elements of the NAPs Guideline. 🌱



2

BACKGROUND

- ... WHAT ARE NAPs?
- ... WHAT ARE NATIONAL DRR STRATEGIES?
- ... FUNDAMENTAL COMMONALITIES
(BETWEEN CCA AND DRR STRATEGIES)

BACKGROUND

WHAT ARE NAPs?

In 2010, Parties to the UNFCCC established the process of formulating and implementing National Adaptation Plans (NAPs) (known as the NAP process) under the Cancun Adaptation Framework and in 2012; the UNFCCC LDC expert group developed a detailed set of NAP technical guidelines to assist developing countries with NAPs.

The guideline outlines four planning elements based on a COP decision on NAPs¹¹:

1. **Element A.** Lay the Groundwork and Address Gaps
2. **Element B.** Preparatory Elements
3. **Element C.** Implementation Strategies
4. **Element D.** Reporting, Monitoring, and Review

The NAP process has the following agreed objectives¹²:

- a. **To reduce vulnerability to the impacts of climate change**, by building adaptive capacity and resilience.
- b. **To facilitate the integration of climate change adaptation**, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

WHAT ARE NATIONAL DRR STRATEGIES?¹³

A National DRR Strategy is **a planning tool that outlines how various sectors and stakeholders in public and private sector will work together** to reduce disaster risk in short-, mid- and long-term. It is important to note that disaster risk reduction is not only about managing disasters and emergencies (short- and mid-term view) but it is also about managing disaster risk (mid- and long-term view). The Sendai Framework for DRR has set Target (E) to increase the number of National and Local DRR Strategies by 2020 (see **Box 4** and **Box 5**).

Disaster risk reduction is not only about managing disasters and emergencies (short- and mid-term view) but it is also about managing disaster risk (mid- and long-term view).

¹¹ UNFCCC decision 5/CP.17, annex.

¹² UNFCCC decision 5/CP.17.

¹³ UNDRR (2019) Words into Action guide on Developing National Disaster Risk Reduction Strategies <https://www.undrr.org/developing-national-disaster-risk-reduction-strategies>



BOX 4. ACHIEVING THE GOAL OF THE SENDAI FRAMEWORK REQUIRES A COMPREHENSIVE ROAD MAP

The Sendai Framework marks a crucial shift from managing disasters to managing risk. It also establishes resilience-building as a shared vision of the 2030 Agenda. Specifically, the Sendai Framework calls for strong political leadership, commitment, and involvement of all stakeholders at all levels to pursue a goal to:

“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.” **Pursuit of such a comprehensive goal requires a strategic approach and a well-defined plan** to ensure efforts are coordinated, while still being whole-of-society inclusive, and to ensure resources are efficiently used across all sectors and by all stakeholders.

DRR strategies and policies should be aligned with the Sendai Framework goal, targets, and priorities for action.

The Seven Targets of Sendai Framework

The targets focus on substantial reductions in:

- a. disaster mortality,
- b. number of affected people,
- c. direct economic losses, and
- d. reducing damage to critical infrastructure and disruption of basic services.

The Sendai Framework also seeks a substantial increase in

- e. national and local disaster risk reduction strategies by 2020,
- f. enhanced cooperation to developing countries, and
- g. a substantial increase in multi-hazard early warning systems, disaster risk information and assessments.

The Four Priorities for Action

Sendai Framework provides guidance to stakeholders at all levels through four 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: UNDRR

Based on the Sendai Framework goal and recommendations, three categories of disaster risk reduction policies, investments and programmes are required to manage risk at short-, mid- and long-term (see **Figure 3**).

Disaster risk management is a planning tool that outlines how various sectors and stakeholders in public and private sector will work together to reduce disaster risk in short-, mid- and long-term. It is important to note that disaster risk reduction is not only about managing disasters and emergencies (short- and mid-term view) but it is also about managing disaster risk (mid- and long-term view). The Sendai Framework for DRR has set Target (E) to increase the number of National and Local DRR Strategies by 2020 (see **Box 4** and **Box 5**).

The value of developing National DRR Strategies is in the process that brings all relevant sectors and stakeholders together to discuss and collaborate to understand existing risks, potential long-term impacts on social and economic growth and plan for actions to reduce risk and build resilience in the long-term.

Development of successful National DRR Strategies that are implementable requires few fundamental building blocks:

- **Strong institutional mechanism and resources** to manage the process of developing national DRR strategy.
- **Understanding the current status of country's disaster risk governance system** and having a strategy for enhancing disaster risk governance system.
- **Understanding risk** including drivers of risk and change in potential risk level in future.
- An approach for **identifying and securing financial resources** for implementation.
- An approach for **developing capacities** needed for implementation.
- **A strong institutional mechanism**, as part of country's disaster risk governance system, to monitor implementation. ↻

Figure 2. The shift from managing disasters to managing risks requires policies and investments to prevent the creation of new risk, reducing existing risk, and managing residual risk with short- and long-term time scales.





BOX 5. 10 KEY ELEMENTS OF NATIONAL AND LOCAL DRR STRATEGIES BASED ON SENDAI FRAMEWORK

Sendai Framework Guiding Principles and Priorities of Action provide clear recommendations on the approach and requirements of DRR strategies. Drawing from the Sendai Framework, 10 key elements have been outlined as requirements to be covered by national DRR strategies:

- i. Have different timescales, with targets, indicators and time frames
- ii. Have aims at preventing the creation of risk
- iii. Have aims at reducing existing risk
- iv. Have aims at strengthening economic, social, health and environmental resilience
- v. Address the recommendations of Priority 1, Understanding disaster risk: Based on risk knowledge and assessments to identify risks at the local and national levels of the technical, financial and administrative disaster risk management capacity
- vi. Address the recommendations of Priority 2, Strengthening disaster risk governance to manage disaster risk: Mainstream and integrate DRR within and across all sectors with defining roles and responsibilities
- vii. Address the recommendations of Priority 3, Investing in disaster risk reduction for resilience: Guide to allocation of the necessary resources at all levels of administration for the development and the implementation of DRR strategies in all relevant sectors
- viii. Address the recommendations of Priority 4, Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction: Strengthen disaster preparedness for response and integrate DRR response preparedness and development measures to make nations and communities resilient to disasters
- ix. Promote policy coherence relevant to disaster risk reduction such as sustainable development, poverty eradication, and climate change, notably with the SDGs the Paris Agreement
- x. Have mechanisms to follow-up, periodically assess and publicly report on progress

Source: "Technical Guidance for Monitoring and Reporting on Progress in Achieving the Global Targets of the Sendai Framework for Disaster Risk Reduction", UNISDR, 2017

FUNDAMENTAL COMMONALITIES (BETWEEN CCA AND DRR STRATEGIES)


The table below outlines few of the key concepts and terms related to disaster risk reduction and climate change adaptation.¹⁴ 

Table 1. The key concepts and terms in DRR and CCA

	Disaster risk reduction ¹⁵	Climate Change Adaptation ^{16,17}
Focus	Disaster risk: The potential loss of life, injury, destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.	Climate Change Impact: Effects on natural and human systems caused by a change in the state of climate identified by changes in the mean over an extended period or by climate extremes.
Approach	Risk reduction: Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.	Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.
Risk	Potential interaction of hazard, exposure, vulnerability and capacity that present the possibility for losses or impacts on a population and elements of a society.	The result of the interaction of vulnerability (including capacity), exposure and hazard.
Hazard	A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.	Natural or human-induced events that have the potential to occur in the future and impact exposed and vulnerable aspects of a system.
Exposure	The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard prone areas.	Existence of elements of human and ecosystems in places and settings that could be adversely affected by climate change.
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.	Potential to be adversely affected, including factors such as susceptibility, predisposition and capacity.
Capacity	The combination of all the strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience.	The combination of all the strengths, attributes, and resources available to an individual, community, society, or organization, which can be used to achieve established goals.

¹⁴ Adapted and modified from N. Banwell, et. al., *Commonalities between Disaster and Climate Change Risks for Health: A Theoretical Framework*, in the International Journal of Environmental Research and Public Health (Published online, 2018).

¹⁵ Report of the Open-ended Intergovernmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction, General Assembly report A/AC.285/CRP.2/Rev.3, November 2016

¹⁶ IPCC, Glossary of terms, in *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)], in *A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change* (IPCC) (Cambridge University Press, Cambridge, UK, and New York, NY, USA, 2012), pp. 555-564.

¹⁷ IPCC, Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, (IPCC: Geneva, 2014), Volume 1, p. 151.

An aerial photograph of a lush green field. A dirt path runs diagonally from the top right towards the bottom right. There are several trees along the path, and a small structure is visible on the right side. The overall scene is bright and sunny.

3

PATHWAYS TO INTEGRATING CCA AND DRR

- ... STRENGTHENING CAPACITIES FOR THE NAP PROCESS
- ... BUILDING THE RISK GOVERNANCE SYSTEM
- ... UNDERSTANDING CLIMATE CHANGE IMPACT AND RISK
- ... DEVELOPING FINANCING STRATEGIES
- ... SELECTING ADAPTATION MEASURES
- ... IMPLEMENTING, MONITORING AND EVALUATION

PATHWAYS TO INTEGRATING CCA AND DRR

Optimizing adaptation planning and implementation to ensure that governments reach the 'last mile first' is an urgent need. The climate has changed and is making the lives of those most at risk – especially at the community level – more vulnerable. For adaptation and risk reduction to be well implemented, there is a need to identify approaches to bring them together. More popularly known as **coherence approaches**, these happen at different levels, with each level adding a layer of value – including being consistent (in the use of terminologies); alignment (of ways of working, policies and plans); having synergies (in objectives, goals, targets); and the integration (of tools, methodologies, etc.), with each one being loosely defined and used, depending on the country and context.

Although not often precisely defined, “coherence” is referred to as:¹⁸

- **An approach to integrate**, as appropriate, the objectives of the global frameworks and the pursuit of sustainable development, disaster risk reduction and climate change adaptation.
- Not an outcome or goal in itself, but **a means to improve the processes and achievement** of global framework goals – in terms of maximizing efficiency, effectiveness, and synergies; and minimizing trade-offs, gaps and redundancies in delivery.
- Occurring not only in policy definition and planning, but also in **implementation, monitoring and reporting**.
- **Pursued both horizontally** across sectors and **vertically** at different governance levels – at the local, sub-national, national, regional, and global levels.
- **Operationalized through different actors** including through coordination between government institutions, the private sector, civil society organizations and citizens.
- **Context-specific** and dependent on country conditions, structures and mechanisms; coherence should be pursued in a flexible manner.

This section will focus on six pathways that can enhance the technical and operational coherence between NAPs and National DRR Strategies.

I. STRENGTHENING CAPACITIES FOR THE NAP PROCESS

Among the key points suggested in the NAP technical guidelines is the identification of the institutional arrangements that are required for effective coordination of the NAP process. Similarly, the capacities required for developing DRR strategies are the following:

- **Administrative capacities** to coordinate and manage the processes
- **Technical capacities** in the form of expertise and tools to assess impacts and risks and design effective measures
- **Financial capacities** to fund the processes

Low capacity is a common challenge faced in developing and implementing NAPs and DRR strategies, especially in low-income countries. Building capacity is a resource intensive process. In preparation for NAP process, all stakeholders and actors should connect to DRR counterparts to benefit from existing experience and capacities. One cost effective mechanism is to build common knowledge platforms for sharing experience, expertise, and tools in CCA and DRR. 🌱

‘Coherence’ is not an outcome or goal in itself, but a means to improve the processes and achievement of global framework goals.

¹⁸ Global Initiative Disaster Risk Management (GIDRM), *Guidance Note: Coherence Concepts and Practices*, (GIZ, Bonn, Germany, 2019). Available at: <https://www.gidrm.net/user/pages/get-started/resources/files/20201216105705-Guidance%20Note%20on%20Coherence.pdf>

II. BUILDING THE RISK GOVERNANCE SYSTEM

Addressing climate and disaster-related risks in various planning processes and investments requires a holistic risk governance approach. This will allow planners and decision-makers to gain better understanding of areas for stronger cooperation and potential bottlenecks.

Risk governance systems and decision-making processes provide the mandate and enabling environment for risk informed decision making and planning. Given the systemic nature of risk and the compounding impacts of disasters, and the fact that countries and communities are experiencing more frequent, more intense and more unpredictable hazards, we need a whole-of-society and whole-of-government approach towards planning, to ensure that all fronts are considered in the prioritization of strategies, resources and actions.

In practice, this means:

- **Broadening the scope of involved actors and bringing in various stakeholders** (national and subnational governments, communities, civil society, knowledge centres, media, private sector, etc.).
- **Institutional arrangements with clear roles and responsibilities** enabling the engagement of and better coordination between all involved actors, such as DRR, CCA and other development stakeholders.
- **Institutionalizing mechanisms that enable information sharing, coordination and collaboration** between sectors and across administrative levels, including decision-makers throughout the risk management process. This will lead to better management of risks through increased ownership, facilitate implementation and policy coherence.
- **Ensuring effective participation of most at-risk members of the population** in the planning process.
- **Consistent and widespread use of gender-sensitive processes, policies and plans** that recognize the different roles, responsibilities, capacities and contributions of men, women, youth and older persons.
- **Presence of strong commitment, leadership and political will;** putting in place monitoring, evaluation and reporting systems, with clear lines of accountability, from start to finish.



A. High level political vision, political will and commitment are essential to transition towards resilient development

Most countries that are prone to climate-related disasters (e.g., Pacific and Caribbean island countries, the Philippines...) have deep convictions about the need to consider climate risks in development planning and the necessity for integration between CCA and DRR. This is often translated into strong political visions for a common goal of climate and disaster resilient development. Conviction can effectively lead to necessary actions, especially when backed by high-level political will. Having this goal clearly articulated in high-level policy documents such as laws, policies or strategic plans at national levels is helpful in providing a strong reference for the planning process. This also helps ensuring continuity in countries with political instability (see **Box 6**).

B. Creating regulatory frameworks to promote an integrated approach for mainstreaming CCA and DRR in development across all sectors is advisable

Regulatory frameworks create more clarity on the roles and actions that actors should undertake at different governance levels and sectors in order to achieve adaptation and risk reduction goals and objectives in national or sectoral planning. This normally requires outlining specific policy objectives for mainstreaming followed up by the creation of appropriate legislation to aid implementation (See **Box 7**).



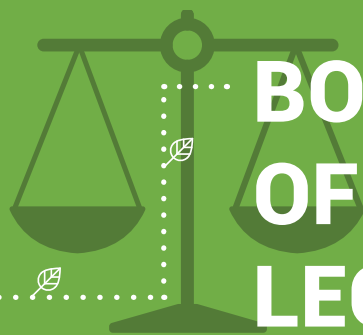
BOX 6. FRAMEWORK FOR RESILIENT DEVELOPMENT IN THE PACIFIC (FRDP)

The Pacific is the first region in the world to fully integrate climate change and disaster risk management into a single overarching regional policy framework. Recognizing the clear overlaps between climate change (CC) adaptation and Disaster Risk Management (DRM), and the similar tools and resources required to monitor, analyse and address climate and disaster risks, most Pacific nations have started taking concrete steps to manage these risks in a more integrated manner.

In 2011, the Pacific region decided to develop a single integrated regional strategy and developed a road map. The **Strategy for Climate and Disaster Resilient Development in the Pacific (SRDP)** is one of the main outcomes of the road map and was finalized and approved in 2015 after a few years of political and technical commitment and collaboration among national governments and many entities at regional and national level. SRDP succeeded the existing separate regional frameworks on DRM and CC which both ended in 2015. In 2016, the Framework for Resilient Development in the Pacific 2017-2030 was developed. The Framework seeks to place sustainable development, which is resilient, front and centre, and recognizes the importance and critical role of political leadership and commitment and the role of central government as key actors. It also embraces the role of the private sector and civil society in building resilience.

Among many other key guidance points and provisions, the strategy recognizes that **social and economic sectors** (such as health, education, water and sanitation, social assistance, energy, agriculture, fisheries, tourism, environment and infrastructure) have a key role to play in implementing resilience building solutions to deliver tangible results for communities.

The FRDP document is available here: http://gsd.spc.int/frdp/assets/FRDP_2016_Resilient_Dev_pacific.pdf



BOX 7. INTEGRATION OF CCA AND DRR IN LEGISLATIVE FRAMEWORK

An IFRC/UNDP review of DRR laws and regulation in various countries indicates that **the integration of DRR and CCA in legal frameworks remains the exception rather than the rule**. The trend in the countries reviewed by the report has been to allocate responsibility for the administration of CCA laws to ministries of the environment, without requiring them to coordinate with DRM institutions, while the DRM institutions are also not required to coordinate with ministries of the environment. However, more recently, a few countries are adopting a new model where both CCA and DRR are integrated with development planning and resource management legislations.

The report recommends that legal frameworks consider:

- Clarifying and specifying institutional mandates
- Allocating dedicated resources
- Facilitating the participation of communities, civil society and vulnerable groups
- Establishing the responsibility and accountability of relevant actors

Algeria, Mexico and Uruguay present three useful examples of integrated legal frameworks. In Algeria, the National Agency on Climate Change, based in the Ministry for the Environment, is responsible for mainstreaming CCA into development planning.

However, since the National Committee on Major Risks, established by the DRM law, is mandated to coordinate all activities on major risks, including implementation mechanisms for the Hyogo Framework for Action (HFA), CCA and DRM institutions, it provides an overarching coordination mechanism. This legal and institutional framework has the potential to achieve a high level of CCA and DRR integration if implemented as planned.

In Mexico, the new General Climate Change Law of 2012 is supported by a special national climate change programme and the Inter-Ministerial Commission on Climate Change, a cross- sectoral coordination body formed by the heads of 13 federal ministries. In Uruguay, the National Response to Climate Change and Variability, a special decree, was passed in 2009. Implemented by the Ministry of Housing, Spatial Planning and the Environment, its purpose is to coordinate actions between all institutions relevant to achieving risk prevention in the whole territory.

Source UNDP & IFRC multi-country report: <http://www.undp.org/content/undp/en/home/librarypage/crisis-prevention-and-recovery/effective-law--regulation-for-disaster-risk-reduction.html>

C. Strong institutional arrangements and coordination mechanisms are needed between CCA and DRR horizontally across sectors and vertically at national, local and community levels

Defining and coordinating institutional arrangements for climate and disaster resilient development is arguably the single most important part of the process and perhaps the most difficult to achieve. This is often due to resistance given that different institutions have historically driven climate change and disaster risk management agendas with separate financial sources and are often weaker entities than sectoral ministries, such as Agriculture, Transport and Energy.¹⁹

In most countries the coordination mechanisms for CCA, DRR²⁰ and development planning are established separately under the leadership of different institutions and with a very low level of overlapping members. Such setups do not tackle the silo approach and reinforce disconnections between the CCA, DRR, and development efforts.

As both climate change and disasters affect multiple sectors, **the design of the coordination mechanism is the foundation for connecting risk assessments and adaptation/risk reduction actions/priorities and integrating them into development planning.** Depending on the context of the country, the functioning modality might either be one coordination mechanism for both DRR and CCA or two fully interlinked mechanisms with a lead agency or agencies that have a strong convening power across multiple agencies and levels of government, as well as the private sector, academia and civil society.²¹ Emerging experience indicates that in order to have effective convening power, the leading agency should be located at the highest possible level of government.

Several countries, such as Kiribati, Samoa, Gambia, Indonesia and Zambia have moved in this direction by establishing lead coordinating agencies under Finance and Planning Ministries, or Offices of the President or Prime Minister. Indonesia has mobilized its central planning agency BAPPENAS to play a key role in the integration of CCA, DRR and resilience with development planning. In addition, there is currently a multi-stakeholder initiative to develop a convergence framework for DRR and CCA that is looking at various aspects of integration.

There is more integration between CCA and DRR at local and community levels, where the linkages and overlays between them are most evident. Aside from local staff doing both CCA and DRR work (due to limited resources), local level planning provides an opportunity for synergies

in planning and implementation.


Efforts to address coordination and institutional arrangements represent an important upfront investment for countries, and one that may take considerable time. Experience so far has shown that investing in designing an integrated, multi-stakeholder and multi-sectoral approach generally results in stronger buy-in from relevant stakeholders and is likely to be more sustainable over the long term.

Investing in designing an integrated approach generally results in stronger buy-in from relevant stakeholders.

D. Fostering partnerships with institutional incentives and creating a shared value for resilience will ultimately lead to the sustainability of implementation

Implementation of the NAP is the job of a wide range of actors across the public and private sectors, at national and subnational levels. Adaptation planning should consider how to create enabling environments to foster partnerships between government, academia, civil society and the private sector as well as incentives for the implementation of synergetic DRR and CCA measures.

The process of resilience-building can provide an opportunity for private organisations to create shared value by integrating risk reduction policies and practices into their businesses as part of their Business Continuity Planning and Enterprise Risk Management that help to secure operating ability during times of shock, increase productivity and resilience and contribute to generating economic, social or environmental benefits. This requires an enabling policy environment involving stakeholders in the public and private sectors including business regulatory bodies.

Academia and civil society have their unique roles and critical capacities and expertise for research, knowledge sharing, community-based and innovative approaches in DRR and CCA, which should be utilized through effective partnerships. 

¹⁹ World Bank. *Building Resilience: Integrating climate and disaster risk into development. Lessons learned from World Bank Group experience.* (The World Bank, Washington DC, 2013).

²⁰ A national level coordination, usually called "National platform for disaster risk reduction" has been established in more than 80 countries.

²¹ World Bank. *Building Resilience: Integrating climate and disaster risk into development. Lessons learned from World Bank Group experience.* (The World Bank, Washington DC, 2013).

III. UNDERSTANDING CLIMATE CHANGE IMPACT AND RISK

Understanding climate and disaster risks is the foundation for planning and investment in managing and reducing impacts, especially on vulnerable communities. Both CCA and DRR require comprehensive information on all dimensions of risks, including hazardous events, exposed assets (people, buildings and critical infrastructure, environment, cultural heritage), various vulnerabilities and capacities. In the NAP process, Element A requires stocktaking of available information on climate change impact and Element B requires analysing current climate change scenarios and assessing climate vulnerabilities and identifying adaptation options.

When establishing the knowledge base for initiating adaptation planning, the relevant authorities can largely benefit from also accounting for, and drawing on, available data and information within the disaster risk reduction community in the country.

The following are a few other broad recommendations for connecting DRR and CCA through the common need for risk information.

BOX 8. GLOBAL RISK ASSESSMENT

Since 2011, UNISDR has spearheaded a multi-hazard **Global Risk Assessment** in partnership with leading scientific and technical organizations, with the aim of providing comparable open-access disaster risk metrics across countries and hazard categories and with a relatively coarse resolution as a means of raising risk awareness.

As part of the 2015 UNISDR-led assessment, **probabilistic hazard** models were developed for earthquakes, tropical cyclone wind and storm surges, tsunamis and river flooding worldwide, as well as for volcanic ash in the Asia-Pacific region and for drought in parts of Africa.

A **global exposure model** for the built environment has been developed at a 1x1 kilometer resolution along coastlines and 5x5 kilometer resolution elsewhere. Appropriate vulnerability functions have been used on the basis of expert knowledge in each region. Recently, the models integrated the impact of climate change on wind hazard in the Caribbean and on drought in Africa. The open-source multi-hazard risk platform CAPRA is used to calculate risk.

In 2017, the **GRAF approach** was conceived and since that time networks of experts have been convened to help formulate GRAF's founding concepts and objectives

The Global Risk Assessment Framework approach is a **long-term initiative** which aims to strengthen the capacity of countries to develop and use risk analysis that comprehends the inter-connectivity of different systems and the cascading and compound nature of risk. The approach seeks to transcend traditional linear risk analyses which have proven to be inadequate in understanding risk today. A core feature of the GRAF approach is creating partnerships between global, regional and national experts in risk, science, investment, policymaking and communication. Technical working groups brought together under the aegis of UNDRR are collaborating on data, methods, models, insights, practical tools and incentives to support countries to assess systemic risks and take risk-informed decisions to achieve sustainable development and prevent and reduce humanitarian needs.

Source: UNDRR

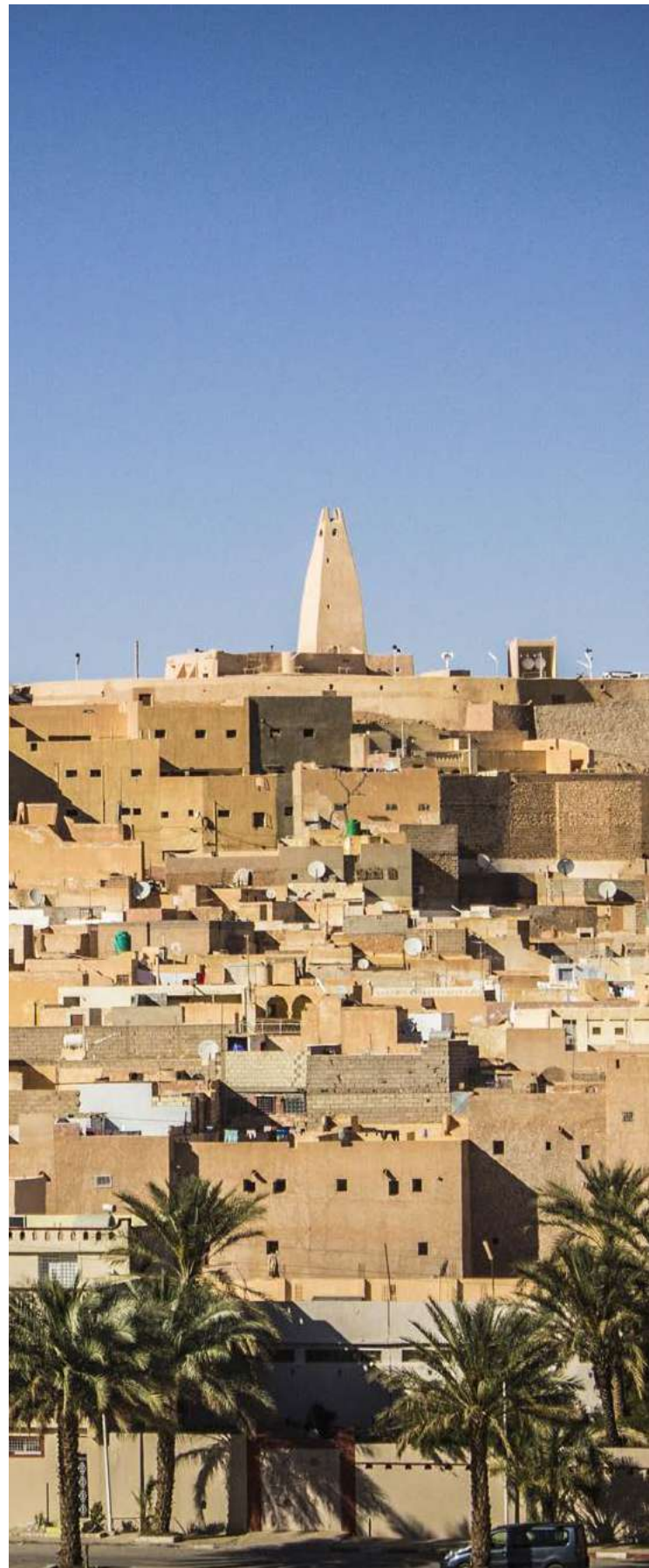
A. Developing central and accessible data-sharing and knowledge management platforms to serve the needs of different CCA and DRR practitioners and decision-makers

In most countries, numerous disaster risk and climate change studies and assessments are available across sectors and levels. In these assessments, information are usually scattered, not easily accessible and not always used in decision-making. **The data hosted by CCA and DRR communities are overlapping and complementary and their integration would provide a comprehensive analysis of the complexities of risks across different timescales.** The NAP process can promote the development of data sharing and knowledge management platforms that enable sharing, maintaining, analysing and managing data, and translating them into forms that are useful for planning processes. This can help inform and serve the needs of different stakeholders working on resilience building.²²

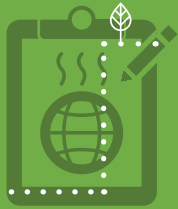
Risk assessments often require significant financial, technical and management resources. Just as climate change impacts and disaster risks have many common components as phenomena, risk assessments conducted to serve CCA and DRR processes would require many common datasets, use many similar tools and analysis methodologies and engage with common stakeholders throughout the process and at the final stage to use the results. The experience of both communities should be usefully combined to support CCA and DRR.

B. Aligning the important terminology and develop standardised methods and criteria for risk assessment

Until recently the climate and disaster communities used different definitions and concepts in their assessment of risks. **The IPCC SREX report and more recently the IPCC 5th Assessment Report have made significant changes to their definition of risk and its components (hazard, exposure and vulnerability) that better match the ones used by the disaster risk reduction community** (see the Open-ended International Expert Working Group report on indicators and terminology).²³



²² See a module on data management from Words into Action guidelines on national disaster risk assessment: [http://www.unisdr.org/files/52828_fdatamanagement\[1\].pdf](http://www.unisdr.org/files/52828_fdatamanagement[1].pdf)
²³ "Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction", A/71/644, December 2016.



BOX 9. UNDERSTANDING CLIMATE CHANGE AND DISASTER RISK IMPACT IN THE ARAB REGION

The Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR) aims to assess the impacts of climate change on freshwater resources in the Arab region and their associated implications for socio-economic and environmental vulnerability. It does so through the application of scientific methods and consultative processes involving both CCA and DRR communities.

The initiative seeks to prepare an integrated assessment that links climate change impact assessment outputs to inform an integrated vulnerability assessment to climate change impacts, such as changes in temperature, precipitation and runoff, droughts or flooding due to shifting rainfall patterns and extreme weather events.

The integrated vulnerability assessment of the Arab region combines climate impact assessment modelling outputs with geospatially referenced statistical data to generate integrated maps that are designed to:

- Foster the mainstreaming of climate change issues into sectoral planning as well as regional and national policy integration.
- Improve policymaking and provide a planning tool.
- Provide capacity building to responsible institutions.
- Raise awareness of intermediate groups.

A particular feature of this vulnerability assessment methodology is that it was developed through a consultative and participatory process with experts from the Arab region through the convening of annual Expert Group Meetings (EGMs) and the establishment of a Vulnerability Assessment Working Group (VA-WG). The VA-WG is comprised of 15 members representing Arab Governments as well as League of Arab States, United Nations and expert organisations serving the Arab region. The working group was assisted by a technical advisory team supported by GIZ and comprised of experts from Adelphi (Germany) and EURAC research (Italy).

More information is available at: <https://www.unescwa.org/climate-change-water-resources-arab-region-riccar>

C. Investing in multi-hazard and climate change impact risk assessments to meet the end-users need

In reality, countries, communities, and citizens rarely face risks from only one hazard or one type of vulnerability.

Adaptation and risk management measures should be designed in the context of multiple and sometimes even overlapping hazards and risks. The NAP guidelines describe how to integrate climate change adaptation in development planning processes in step B5. In the context of CCA and DRR this would mean to start with understanding development priorities, current stressors and vulnerabilities, and then projecting climate impacts and disaster risk over relevant timescales to understand the interaction between current and future risks and climatic and non-climatic hazards.^{24,25}

A comprehensive risk assessment with a multi-hazard approach that considers the interaction of climate and non-climate related hazards and various vulnerabilities (i.e., socio-economic vulnerabilities of different societal groups) would allow setting priorities and design measures that have co-benefits in managing more than one risk without negative impacts on other risks. **In recent years, there has been good progress in facilitating technical exchange and conducting comprehensive risk assessments and management**, including at the regional level (see example in **Box 9**).

²⁴ The Independent Evaluation Group (IEG), *Adapting to Climate Change: Assessing the World Bank Group Experience, Phase III* (World Bank, Washington DC, 2013).

²⁵ USAID, *Climate Resilient Development – A framework for understanding and addressing climate change* (USAID, Washington DC, 2014).

D. Understanding the evolving nature of risk and estimate the future risk

Risk is not static and risk assessments need to account for spatial and temporal changes in hazard, exposure, and vulnerability. This is an area where disaster risk assessment has been evolving rapidly to incorporate changes in exposure and vulnerabilities and with more uncertainty due to climate change. However, climate is not the only driver of change. Development patterns can drastically alter future risk by increasing or decreasing exposure and vulnerability (e.g., through rapid and unplanned urbanization). The main data sets that enable assessing and quantifying current risks are the same as those required in determining the impacts of adverse events in the future. It is therefore critical for both the disaster risk reduction and climate change communities to continue investing in fundamental data, frameworks and innovation that consider climate scenarios and data on social, economic and ecological assets that impact vulnerability. Collecting and analysing risk information for current and long-term climate scenarios is becoming a priority for various stakeholders from the local communities, national agencies, private sector and international organizations as well as academic and research institutions which often have extensive and pioneering experience relevant to these efforts. This provides new opportunities for all these actors to cooperate and partner across CCA and DRR to share information for building resilience.

E. Making use of existing national and international disaster loss and damage databases

To enable countries to understand climate and disaster-related risk at the national level, it is important to have an understanding of **(a) the full picture of disaster impacts** (including damages and losses) as well as other risk variables associated with trends of extreme and slow onset events and other climate-related hazards; and **(b) climate observational data and/or climate model projections.**

This information can support countries' risk-informed and evidence-based decision-making processes, including the identification of adaptation needs and risk management options. In addition, information on disaster losses and damages, together with climate and weather forecasts and projections can provide countries with key information needed for national planning and budgeting, enabling countries to provide resilience interventions for people most at-risk.

To this end, **disaster loss data reveals more than just impacts:** it gauges levels of resilience, vulnerability and exposure, highlighting underlying conditions that make people and places susceptible to disaster impact. Furthermore, it has the largely untapped potential to provide essential information for climate change adaptation, in terms of estimating climate change impacts and attribution studies, measuring risk, assessing adaptation needs, etc. 🌱

BOX 10. WORDS INTO ACTION GUIDELINE ON NATIONAL DISASTER RISK ASSESSMENT

In 2016, the United Nations Office for Disaster Risk Reduction (UNISDR) commissioned the development of **Words into Action (WiA) guidelines** which was developed as the result of the collaboration between over 100 leading experts from national authorities, international organizations, non-governmental organizations, academia, research institutes and private-sector entities. The WiA guidelines are intended to:

- a. **Motivate and guide countries in establishing a national system for understanding disaster and climate risk** that is integrated with policy development mechanisms and would act as the central repository of all publicly available risk information. This national system would lead the implementation and updates of national disaster risk assessment for use in disaster risk management, including for risk-informed disaster risk reduction strategies, climate change adaptation and development plans.
- b. **Encourage taking a holistic approach in risk assessments** that would provide an understanding of the many different dimensions of risk (hazards, exposures, vulnerabilities, capacities). The assessments would include diverse types of direct and indirect impacts of disaster – physical, social, economic, environmental and institutional. They would also provide information on the underlying drivers of risk – climate change, poverty, inequality, weak governance and unchecked urban expansion. Results from such risk assessment can serve various policies and investments in DRR, CCA and development.

The guidelines introduce ten enabling elements to conduct successful risk assessments with a process that is integrated in policy and investment planning.

Source: UNISDR *Words into Action Guidelines on National Disaster Risk Assessment*, 2017.
<http://www.unisdr.org/we/inform/publications/52828>



BOX 11. ABOUT NATIONAL DISASTER DAMAGE AND LOSS DATABASES

Disaster databases record losses and damages across a number of parameters typically including deaths, economic losses, and physical damages and losses in each affected sector (housing, infrastructure, etc.). The geographic area affected, and the types of hazard are also recorded. Over time, the accumulated data provides information on cumulative loss and damage, its geographic and possibly demographic distribution, the priority hazards, the types of loss and damage that occur and temporal trends.

This is particularly important as **the majority of damage and losses since 1990 have been associated with extensive events** (frequent and low impact) in those countries with consistent data sets. Data systems that consider and monitor extensive risks are essential to inform adaptation, DRR and development planning, given that increases in extensive risk directly threaten efforts to reduce poverty and achieve the Sustainable Development Goals. Using sex and age disaggregated data and gender analysis in developing local and national development and risk reduction plans is particularly important to ensure gender analysis is core component in development, CCA and DRR planning and programming.

Today more than 100 countries around the world have national or local historical disaster loss and damage, using the DesInventar disaster information management system – a web-based tool sponsored and hosted by UNDRR (<https://desinventar.net>). It is important to point out that loss and damage databases are important tools required for monitoring and measuring progress in disaster risk reduction. Many more countries are in the process of establishing their national databases as part of getting ready for monitoring and reporting on the Sendai Framework implementation.

There are a number of global and regional disaster risk databases and information systems that can support the NAP process as well as guidelines for establishing damage and loss databases. These are outlined in **Annex I**.

Source: UNDRR

Indonesia disaster loss database

The development of a disaster loss database for Indonesia gained momentum when the National Disaster Management Agency (BNPB) was formally established in January 2008. Since then, the **'Safer Communities through Disaster Risk Reduction in Development Programme'** supported by UNDP has accelerated the implementation of the database and the Disaster Data and Information of Indonesia (DiBi) was launched by the head of BNPB in July 2008 with data from 2002-2006.

The Government of Indonesia and UNDP customized the database system to respond to the government needs and requirements and embarked on collecting and validating historical disaster data from the past 30 years. The database is one of the main data sets being used to guide the ongoing process for developing national DRR and CCA plans as well as for monitoring the impact on poverty at the community level.

A visual public platform has been created to share this data with all stakeholders: <http://dibi.bnpb.go.id/bnpb/>

Source: UNDP

IV. DEVELOPING FINANCING STRATEGIES

Sustainable, predictable and increasing finance is key to realizing the objectives and targets of plans and strategies. To achieve this, the involvement of Ministries of Finance, private sector groups, and donor communities should be seriously considered in developing NAP and National DRR Strategies. And as risks become more and more complex, resulting in cascading impacts on systems and people, it is becoming essential to revise existing financing mechanisms and strategies and their enabling policy environment, in order for countries to adapt and institutionalize resilience building efforts (such as anticipatory financing, among others).

A. Conducting joint assessments of the current financial policies and institutional arrangements and defining incentives for resilience building

Conducting joint assessments allows for the identification of common financial gaps and opportunities and more efficient financing of adaptation and risk reduction plans, programs and activities. Many countries have undertaken assessments of both their CCA and DRR policies, as well as institutional and financial arrangements. **Box 12** shows an example from Bangladesh.

As risks become more and more complex, resulting in cascading impacts on systems and people, it is becoming essential to revise existing financing mechanisms and strategies and their enabling policy environment.

BOX 12. SCOPING FINANCIAL NEEDS AND AVAILABLE SOURCES FOR CCA AND DRR: LEARNING LESSONS AND UTILIZING TOOLS AVAILABLE FOR ASSESSING CLIMATE FINANCING

In 2016, the United Nations Office for Disaster Risk Reduction There have been more efforts and experiences gain in assessing fiscal framework for responding to climate change across sectors and between public and private sources at national and local levels. There are lessons to learn, tools to use and efforts to utilize for assessing finances for DRR. One strong set of tools is Climate Public Expenditure and Institutional Reviews (CPEIR).

CPEIR are helpful tools for analysing the linkages between national climate change policies; the institutional structures through which the policies are channelled; and the resource allocation processes whereby public funding is made available for the implementation of relevant projects, programmes and policies.

Bangladesh used a CPEIR to review budgets and expenditure on climate change over a three-year period from 2008/09 to 2011/12. The analysis focused primarily on the government budget, reviewing the overall allocation of resources; the mechanisms delivering climate finance; the financing of climate spending, the main agencies involved; their processes and the nature of the budgets delivered.

The Bangladesh CPEIR highlighted that large portions of the climate response in the country relate to adaptation strategies that are by several ministries ranging from infrastructure to social protection programmes as well as a strong link to DRR. It also highlights that adaptation expenditures often contribute to more than one single outcome. Indeed, the purpose of adaptation activities will contribute to a number of outcomes including disaster risk reduction and broader development resilience.

Source: <https://www.climatefinance-developmenteffectiveness.org/>

B. Incentivizing adaptation and risk reduction actions

Perverse incentives induce counterproductive behaviours, which can lead to the increase or emergence of risks, either by fostering overly risk-prone behaviours or by discouraging risk prevention. Positive incentives are also needed to encourage good behaviours. Those include subsidies and fiscal benefits to avoid exposure and reduce vulnerability.

Box 13, 14, 15 provide information on three experiences at national level in incentivizing risk reduction through financial mechanisms.

BOX 13. INCENTIVIZING LEADING INVESTMENTS IN FLOOD PLAINS AROUND BANGKOK

Thailand's powerful Board of Investment (BOI) encouraged investment in **three promotional zones**. Sectoral incentives through BOI-identified priority projects and privileges provided by the Industrial Authority of Thailand (IEAT). Although privileges offered in Zone 1, the areas surrounding Bangkok, were lower than those offered in regions further inland, they were still substantial, including corporate tax exemption for three years and a 50 percent reduction on import duty for machinery. Although this policy was successful in attracting FDI, it led to massive increases in flood exposure. Much of the investment took place in former rice paddies located in floodplains of the provinces, which paved the way for the 2011 Chao Phraya flood disaster.

Source: UNISDR (2013) *From Shared Risk to Shared Value – The Business Case for Disaster Risk Reduction. Global Assessment Report on Disaster Risk Reduction*

BOX 14. INCENTIVIZING VULNERABILITY REDUCTION IN INSURANCE SCHEMES IN THE UNITED STATES

Subsidizing insurance can provide a perverse incentive to managing risk. In the United States, FEMA had previously subsidized home insurance in hurricane prone coastal areas because private insurance costs were considered too high, despite them being based on actuarial risk assessments. Following Superstorm Sandy in 2012, FEMA developed a new system that provides **subsidies for homeowners to implement measures that reduce their risk**.

Source: IFRC & UNDP, *Effective law and regulation for disaster risk reduction: a multi country report* (IFRC & UNDP, New York, 2014).

BOX 15. MEXICO'S FUND FOR NATURAL DISASTERS (FONDEN)

FONDEN is Mexico's **Fund for Natural Disasters**. It was established in the late 1990s as a mechanism to support the rapid rehabilitation of federal and state infrastructure affected by disasters. It can support the rehabilitation and reconstruction of:

- a. Public infrastructure at the three levels of government (federal, state and municipal)
- b. Low-income housing
- c. Certain components of the natural environment (e.g., forestry, protected natural areas, rivers and lagoons)

FONDEN has two **complementary budget accounts**, the original FONDEN Program for Reconstruction and the Fund for Disaster Prevention (FOPREDEN) that was designed in recognition of the need to promote stronger ex-ante disaster risk management. This highlights a shift in focus of the efforts and funding by the Mexican Government from ex-post response to ex-ante prevention. Despite that, resources for prevention remain significantly less than those for reconstruction.

FONDEN is funded through the Federal Expenditure Budget, at **a legally required amount of no less than 0.4% of the annual federal budget** or about US\$800 million (available to FONDEN, FOPREDEN and the Agricultural Fund for Natural Disasters).

The **FOPREDEN Program for Prevention** funds activities related to risk assessment, risk reduction and capacity building on disaster risk reduction. It promotes informed decision making about investment in DRR by requiring states to complete a risk assessment (including the development of a risk atlas) before being eligible for financing for risk mitigation projects.

FONDEN is continuously evolving to integrate lessons learned, with modifications by the Mexican Government in order to enhance its efficiency and effectiveness and move toward a comprehensive DRM framework.


Source: *The World Bank, FONDEN, Mexico's Natural Disaster Fund—A Review*, (World Bank, Washington, DC, 2012).

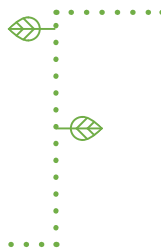
C. Anticipatory Financing

One of the largest impacts of a changing climate will be changes to the frequency and magnitude of extreme events. In today's climate, we are already seeing an increase in extreme events, and we expect this to continue a 1.5°C and warmer world. While long-term investments in reducing disaster risks can help adapt to these changing extremes, we often do not know how much extremes will change in any given location. Particularly in the most vulnerable places of the world, there are high uncertainties about how extreme events will change with climate change.

Therefore, a critical component of climate change adaptation and disaster risk reduction is to increase countries' capacity to act on these extremes using information on shorter timescales. Most of the major disasters induced by natural hazards in recent years were forecasted before they caused impact. However, most financing mechanisms remain largely focused on after-the-fact events, and anticipatory actions rarely get funding. **To be effective, climate change adaptation and risk reduction investments need to build up early warning systems as well as improve the capacity to act when an early warning arrives.**

We know early action can save lives, even if we cannot predict today how many extremes to expect in a specific city in 2050. For example, there is large uncertainty in climate models about what changes we can expect to the West Africa Monsoon season. To address this, early actions based on seasonal and short-term forecasts could promote early harvesting to minimize crop loss and enable sanitation campaigns to reduce human morbidity. When a heatwave is forecasted, we can reduce mortality and morbidity quickly through awareness campaigns, water distribution, and visits to homebound people.

Anticipatory financing is part of a continuum of climate change adaptation solutions, complementing long-term investments in risk reduction and allows for early actions to be conducted based on early warnings. **Forecast-based Financing (FbF)** is an example that is slowly gaining momentum and is being used/implemented in various countries. Forecast-based Financing (FbF) is a programme that enables access to humanitarian funding for early action based on in-depth forecast information and risk analysis. The goal of FbF is to anticipate disasters, prevent their impact, if possible, and reduce human suffering and losses.²⁶ 



To be effective, climate change adaptation and risk reduction investments need to build up early warning systems as well as improve the capacity to act when an early warning arrives.

²⁶ See: <https://www.forecast-based-financing.org/about/>

V. SELECTING ADAPTATION MEASURES

The selection of adaptation measures is another important pathway for bringing together climate change adaptation and disaster risk reduction efforts. Given the high degree of overlap between those two approaches, a close coordination between the NAP and National DRR processes can avoid duplications and enhance effectiveness and financial efficiencies.

A. Conducting joint exercise with DRR stakeholders to identify overlaps and complementarity between adaptation and DRR measures

The identification, review and appraisal of adaptation options can be undertaken jointly with DRR stakeholders. The joint evaluation and appraisal of adaptation options by climate change, disaster risk management and other development agencies can identify complementarity, sequencing and/or combination of measures to that will enable all to comprehensively manage risks. This area in particular requires strong coordination with development planners, authorities and stakeholders at the local and municipal levels, which are normally in charge of implementing both CCA and DRR measures. Their engagement will help better inform the national processes and provide opportunities for integration and alignment.

Often, risk reduction measures coincide with adaptation measures, particularly at the local level, but are referred to differently. DRR agencies can help identify appropriate adaptation measures, inform whether these measures are already being implemented or planned and advise on their suitability for the specific context, particularly to ensure the measures would not exacerbate risk of another hazard. See **Box 16** for an example.

B. Avoiding mal-adaptation, inefficient use of resources and unintentional creation of new risk through sharing of information

Risk-blind planning can result in maladaptation - adaptation measures that do not take risks into account could actually result in increasing risk or inefficient use of resources. For example, building a seawall to provide protection against storm surges and sea-level rise does not necessarily take into account tsunamis or land subsidence, which could result in exacerbating the impacts of storm surges and coastal flooding (e.g., trapping flood waters behind the sea wall). Adaptation planning, hence, needs to be based on strengthened risk analytics, which will also enable more effective preventive and anticipatory action to reduce the humanitarian impacts of climate-related disasters.





BOX 16. THE DUTCH DELTA PROGRAMME AS AN EXAMPLE OF A LONG-TERM PROGRAMMATIC APPROACH

The Delta Programme is a nation-wide Dutch programme aimed at keeping the Netherlands a safe and attractive place to live and work, for present and future generations. The Delta Programme explicitly links disaster risk reduction (related to flood risk management) and climate change and capitalizes on the synergies between both.

The Delta Programme has introduced **new risk-based standards** in flood protection policy. These new standards are based on three risk indicators:

1. **Individual risk:** The probability of mortality as a result of a flood. This standard was introduced to be aligned with other disasters (e.g., chemical or nuclear accidents).
2. **Economic risk:** Prevent major economic damage to a level for which total societal costs are minimized.
3. **Societal risk:** Prevent failure of vulnerable functions with national scale consequences.

In its flood protection strategy, the Delta Programme is promoting **multi-layer safety policies and measures** in which an optimal mix is proposed between prevention, sustainable spatial planning and crisis management. These elements are closely related to the term's prevention, preparedness and response of the disaster management cycle.

A key element in planning is the so-called '**Adaptive Delta Management**' (ADM). This is a new planning approach, defined as "a smart way of taking account of uncertainties and dependencies in decision-making on Delta Management with a view to reducing the risk of overspending or underinvestment". ADM starts out from short-term measures, which are linked to long-term perspectives. Short-term measures must be logical in the long-term: they are useful, do not obstruct long-term measures, or are even necessary to keep long-term options open.

A second key feature of the Delta Programme is **its organizational structure**, which aims at horizontal integration between the responsible ministries and vertical integration with lower-level authorities like water boards, provinces and municipalities and the so called 'Safety regions' (in which emergency organizations cooperate).

A third key element is that the Delta Programme was given **a firm legal basis in the 'Delta Act on Flood Risk Management and Freshwater Supplies' (Delta Act)**. This act also anchors the funding of the Delta Programme. The Delta Fund ensures that sufficient financial resources are dedicated to the objectives of the Delta Programme.

Lastly, the Delta Programme actively promotes the **collection, sharing and use of data and knowledge**. It has set up a knowledge portal to inform municipalities and provinces. It involves universities, knowledge institutes and implementation agencies closely. The models for impact and risk assessment and for evaluation of new flood risk management plans are shared by DRR and CCA communities. For instance, there is a public data base with risk assessment data and inundation model results that is valuable input for crisis managers making evacuation plans and water managers planning for long term investments.

Further reading:

- <https://english.deltacommissaris.nl/delta-programme/contents/what-is-the-delta-programme/adaptive-deltamanagement>
- <https://english.nctv.nl/>
- <http://ruimtelijkeadaptatie.nl/english/>
- www.lizard.net

Source: Deltares



BOX 17. EVALUATING AND COMPLEMENTING EXISTING EARLY WARNING SYSTEMS (EWS) TO SERVE VARIETY OF HAZARDS

Effective early warning systems require **four elements**:

1. **Risk knowledge** (systematically collect data on hazards, exposure and vulnerability and conduct hazard and risk assessment).
2. **Technical hazard monitoring and warning service.**
3. **Communication and dissemination** of warnings and impact/risk information.
4. **Response capability** (or early action capability) to build country and community capability to respond for example evacuation capability and emergency planning

Major advances have been made in hazard monitoring and forecasting and in the development of EWS. However, **most systems often don't integrate all four elements in order to have an effective EWS.**

For example, many EWS often prioritize monitoring and forecasting hazards and may omit or underestimate the key importance of exposure and vulnerability in explaining risk levels. Exposure and vulnerabilities (social, physical, and environmental) provide critical information for designing and setting up mechanisms for communication of information and for building capacities for early action and response.

The NAP process should build upon and complement the existing EWS, taking into account the common elements that would serve multi-hazard EWS covering both climate and non-climate hazards (for example, use of text messages as a communication element).

Specific to risk knowledge element of EWS, **climate information systems should integrate complementary information on vulnerability and risk drivers** (such as social, economic and environmental drivers, such as environmental degradation, poverty and inequality, vulnerable rural livelihoods and weak governance) to effectively inform and trigger action, particularly in the context of slow-onset events and extensive risks.

Source: UNDP

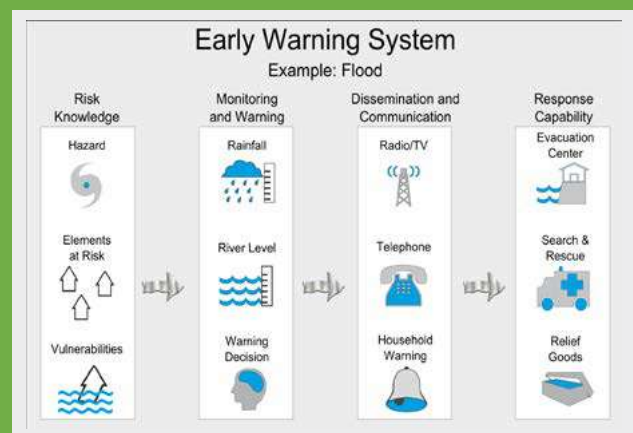


Figure 3. Four elements of Early Warning Systems
(Source: Global Initiative on Disaster Risk Management)

C. Prioritizing measures

Ranking and prioritizing adaptation options is an important step in this process. The NAP process can benefit from the experiences and tools within the DRR communities to help in selecting and prioritizing adaptation options. In addition, the CCA and DRR stakeholders can agree on a number of criteria to prioritize adaptation and risk reduction options; chief among them should be providing win-win scenarios while contributing to various (adaptation, risk reduction and development) objectives at the same time. When complementary actions are prioritised, progress can be accelerated, and duplication can be reduced – and ideally eliminated. See example of ecosystem-based adaptation measures in **Box 18**.



BOX 18. ECOSYSTEM-BASED ADAPTATION MEASURES: PROVIDING CO-BENEFITS FOR CCA, DRR, AND DEVELOPMENT

Ecosystem-based approaches to adaptation and disaster risk reduction (EbA & Eco-DRR) utilizes ecosystems and biodiversity to integrate climate change adaptation, disaster risk management and development planning to provide benefits for people and nature beyond adaptation and disaster risk reduction within the overall framework of sustainable development.

Sustainable ecosystem management has the potential to influence all three elements of the disaster or climate risk equation – in terms of regulating and mitigating hazards, controlling exposure and reducing vulnerability. This is extensively documented in a large body of literature and studies from all regions:

- i. Healthy and well-managed ecosystems can act as natural infrastructure that buffers hazard impacts. For example, coral reefs, sea grasses, sand dunes and coastal vegetation such as mangroves and saltmarshes can effectively reduce wave heights and reduce erosion from storms and high tides, while buffering against saltwater intrusion and trapping sediment and organic matter.
- ii. Healthy and well-managed ecosystems also can help reduce the exposure of people and their productive assets to hazards: in drylands, maintaining vegetation cover and agricultural practices such as use of shadow crops, nutrient-enriching plants and vegetation litter increase resilience to drought by conserving soil and retaining moisture.
- iii. Well-managed, healthy ecosystems can reduce vulnerabilities to climate impacts and disasters by supporting livelihoods that are sustainable and resilient to disasters: Ecosystems sustain human livelihoods and provide for basic needs, such as food, shelter and water – before, during and after hazardous events.

Investment in sustainable ecosystem management as CCA or DRR strategies provides multiple social, economic and environmental benefits and are often regarded as “no-regret”.

Source: *The role of ecosystems in disaster risk reduction*, ed. Renaud, Fabrice G., Sudmeier-Rieux, Karen and Estrella, Marisol (Tokyo: UNU Press, 2013).



Figure 4. Ecosystem-based approaches to adaptation and disaster risk reduction (EbA & Eco-DRR) (adapted from Midgley et al., 2012, DEA & SANBI 2017, and Sudmeier and Ash 2009)

VI. IMPLEMENTING, MONITORING AND EVALUATION

A. Fostering partnerships and creating a shared value for resilience across sectors will ultimately lead to the sustainability of results

The adaptation planning process should consider how to create enabling environments and incentives to foster partnerships between government, civil society and the private sector, as well as incentives for the implementation of synergetic CCA and DRR measures and inclusive approaches with communities. The process of resilience-building can provide an opportunity for academic, public and private organisations to create shared value by integrating risk reduction policies and practices into their businesses that help to secure their operating ability during times of shock, increase productivity and resilience and contribute to generating economic, social or environmental benefits. This requires an enabling policy environment involving stakeholders across institutions as well as business regulators.

B. Long term success in implementing climate and disaster resilient development requires long-term monitoring mechanisms that transcend political cycles

Monitoring implementation and progress in risk reduction is challenging and resource intensive. However, it contributes to having **effective national and local accountability mechanisms for reporting and follow-up with responsible entities**. These mechanisms are critical to assess progress and adjust the course of action to manage obstacles to achieving the results. A CCA and DRR integrated monitoring mechanism is a sensible pathway for connecting the two and to ensure efficient use of resources.

The selection of indicators is one of the first steps in establishing an integrated monitoring system. Capturing the full scope of progress would also require monitoring risk management outputs across all development sectors with respect to whether the underlying risk drivers, such as poverty and environmental degradation, are being addressed. At the global level, indicators have been approved for monitoring the Sendai Framework for DRR and the SDGs. Few indicators that also cover climate change adaptation aspects are common between the two frameworks. See **Box 19** for the list of these indicators.





Designing monitoring systems is the other pathway for linking and integrating NAP monitoring with DRR monitoring. Monitoring mechanisms at national and local levels need to be empowered through:

- **Political ownership** at the highest level of the national or sub-national government.
- **Legislative or policy mandates** to oversee public and private stakeholder actions.
- **Engagement, coordination and consultation capacities** through a multi-stakeholder mechanism and common understanding and acceptance of roles and responsibilities in monitoring and reporting on CCA and DRR progress across all governmental entities. As well as stakeholders evaluating and tracking adaptation and risk management impacts, including how the measures impact development.
- Innovative methods to have two-way **communication and feedback mechanisms from civil society and the general public.**
- **Information management mechanism** to collect data and reports, consolidate and analyse and prepare reports for local to national to global levels.
- The **connection and interlinkages with disaster loss data collection systems** and the national statistics office.

Following the recommendations by Open-ended Intergovernmental Expert Working Group (OIEWG), UNDRR has developed a web-based monitoring system of the Sendai Framework monitoring mechanism. The **Sendai Framework Monitoring (SFM) system** has been operational since March 2018, and it allows Member States to assess their progress in the implementation of the Sendai Framework by using global indicators endorsed by the United Nations General Assembly. The full set of global indicators for Target A through Target E of the Sendai Framework are also used for monitoring the SDGs. Once Member States report data for the common indicators through the online Sendai Framework Monitoring system, UNDRR, as a custodian agency of DRR related indicators of SDGs, compiles and reports the data to UNDESA, which can reduce this reporting burden for Member States. In order to enhance monitoring and reporting on progress in implementing the Sendai Framework at local, national, regional and global levels, the SFM system can also accommodate Custom Targets and Indicators. 🌐



BOX 19. SDG TARGETS AND INDICATORS THAT ARE COMMON TO SENDAI FRAMEWORK AT THE GLOBAL LEVEL REQUIRE INTEGRATED MONITORING OF CCA AND DRR PROGRESS

In 2016, United Nations General Assembly approved a set of 36 global indicators defined by the Open-ended Intergovernmental Expert Working Group (OIEWG) to monitor progress in achieving the seven global targets of the Sendai Framework for Disaster Risk Reduction 2015-2030. Few of these indicators have been directly adapted by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs). The common indicators are related to Goals 1, 11 and 13 with clear parameters that would aid in monitoring building resilience to climate change impact and disaster risk.

Goal 1. End poverty in all its forms everywhere

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

Indicators:

1.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people

1.5.2 Direct disaster economic loss in relation to global gross domestic product (GDP)

1.5.3 Number of countries with national and local disaster risk reduction strategies

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

Target 11.b: By 2020, substantially increase 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, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

Indicators:

11.b.1 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030a

11.b.2 Number of countries with national and local disaster risk reduction strategies

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

Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

Indicators:

13.1.1 Number of countries with national and local disaster risk reduction strategies

13.1.2 Number of deaths, missing persons and persons affected by disaster per 100,000 people

4

CHECKLIST FOR CONSIDERING DISASTER RISK REDUCTION APPROACHES WITHIN THE NAP

... IN THE CONTEXT OF THE SENDAI
FRAMEWORK AND THE PARIS AGREEMENT



CHECKLIST FOR CONSIDERING DISASTER RISK REDUCTION APPROACHES WITHIN THE NAP IN THE CONTEXT OF THE SENDAI FRAMEWORK AND THE PARIS AGREEMENT

The following is a checklist to guide consideration of risk reduction and risk-centred approaches in a manner that addresses the needs in developing both National DRR Strategies and National Adaptation Plans. The checklist below has been structured along the four main elements and steps identified in the UNFCCC Technical Guidelines for the National Adaptation Plan Process developed by the LDC Expert Group in December 2012.

This checklist can be adjusted to suit the needs and circumstance of each country.

Steps	Key questions
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Lay the Groundwork and Address Gaps

1. Initiating and launching the national adaptation plan (NAP) process

- *What are the existing national institutional arrangements for dealing with natural hazards that the NAP process can connect to?*
- *In creating the mandate for the NAP, how can its institutional arrangements be designed to facilitate linkages with National DRR/DRM strategy processes?*
- *What are the timelines of other planning processes that should be considered in the NAP process?*
- *How can non-climate stakeholders be considered in the reporting arrangements for various stakeholders?*
- *How can technical and financial arrangements be maximized to sustain and/or support planning and implementation processes for both NAP and National DRR Strategies?*

2. Stocktaking: Identifying available information on climate change impacts, vulnerability and adaptation and assessing gaps and needs of the enabling environment for the NAP process

- *What data and knowledge are available to both NAP and DRR communities to assess current and future climate-related and disaster risks, vulnerabilities and exposure?*
- *Where do these two groups get their risk-information/data? Are they the same? Can they be linked?*
- *How can the storage and management of this data and knowledge be best coordinated by NAP and DRR planners/practitioners?*
- *What existing technical and financial resources and capacities in the DRR strategy process can be utilized for the NAP process?*
- *Is it possible to create synergies between the outputs of NAP and the outputs of the DRR strategy/plan (i.e., in the approach, format, communication, etc.)?*
- *What reporting arrangements are required for NAP to ensure they reach the DRR/DRM actors at early stages of the NAP process including a clear message about how CCA and DRM can be mutually reinforcing and efficiently conducted?*

3. Addressing capacity gaps and weaknesses in undertaking the NAP process

- *What are the common capacity gaps in undertaking NAP and National DRR/DRM Strategies? Can they be addressed together?*
- *What capacity and capacity building support are available within DRR/DRM institutions, including from civil society, universities and the private sector, that can be utilized for the NAP process, and vice versa?*
- *Are there capacity building exercises undertaken within DRR/DRM that can help support NAP capacity building, and vice versa?*
- *Where are the opportunities for integrating climate change adaptation and disaster risk reduction into development planning?*

4. Comprehensively and iteratively assessing development needs and climate vulnerabilities

- *What key development goals can help communities adapt to and reduce risks due to the changing climate?*
- *How can climate and disaster risks to development and potential co-benefits of adaptation and risk reduction efforts and development be identified?*
- *What sectors have already considered risk reduction, risk management and/or resilience building strategies or activities for climate-related hazards and how are these related to NAP objectives?*
- *Are there existing capacities within various sectors in mainstreaming risk reduction and risk management approaches that can enable integration of CCA into sectors?*
- *What barriers exist in the risk governance system to improve links/alignment with National DRR Strategies and how can they be addressed through the design and implementation of NAPs?*
- *Are there comprehensive or integrated risk assessment tools and approaches available in the country that can be used by NAP and DRR/DRM practitioners and planners alike?*

Steps

Key questions

*Preparatory Elements***1. Analysing current climate and future climate change scenarios**

- Which weather, seasonal and climatic patterns in the country, according to observed data, are most important in terms of adjustment, risk reduction, adaptation or acclimatization of social systems and socio-economic structures?
- What risks do climate change, in the short-, medium- and long-term, hold for the country, including those that exacerbate other hazards and/or vulnerabilities?
- What are major current climate and disaster-related hazards, including extreme and slow onset events?
- What are appropriate indices and thresholds of climate and non-climate trends that could support planning and decision making for both NAPs and National DRR Strategies?
- What types of risk and forecast information can be used by both the adaptation and the risk reduction communities?
- What are the climate-related hazards and how do they interact within a broader risk context?
- How are climate and disaster risks considered in the broader scope of adaptation and development?
- Which extreme and slow onset events are happening in the short-, medium- and long-term? How do they affect the vulnerability of sectors, communities and institutions at the national and subnational levels?

2. Assessing climate vulnerabilities and identifying adaptation options at the sector, subnational and other appropriate levels

- Which are the key vulnerabilities at the sectoral and subnational levels in the country?
- What are the expected impacts of climate change and other natural hazards?
- Which of these are addressed in the NAP and/or National DRR Strategies and in local/subnational adaptation and risk reduction plans, including in development plans?
- What mechanisms are in place to monitor and update changing patterns in exposure and vulnerability at the national and subnational levels?
- What information is available on extensive disaster risks (i.e., from national disaster loss database) and how do they interact with slow onset events?
- What available integrated or comprehensive risk management approaches can be used in both NAP and National DRR Strategies? Can risk assessments be designed to serve both purposes with more efficient use of technical and financial resources?

3. Reviewing and appraising adaptation options

- Can the Sendai Framework and Paris Agreement goals, targets and objectives be integrated and/or considered in development planning processes?
- How are disaster and adaptation activities and financial needs integrated in national budgets?
- Have resilience strategies at national and subnational levels (including in cities) been taken into account in an integrative, cross-sectoral manner, to address synergies as well as trade-offs of interventions (e.g., water, food, energy, health, infrastructure)?
- Can the proposed adaptation measures also reduce impacts from disaster risks?
- What additional benefits do the measures provide in terms of reducing risk, strengthening resilience and in advancing development goals (i.e., managing drivers of risk such as inequality, poverty, weak governance)?

Steps

Key questions

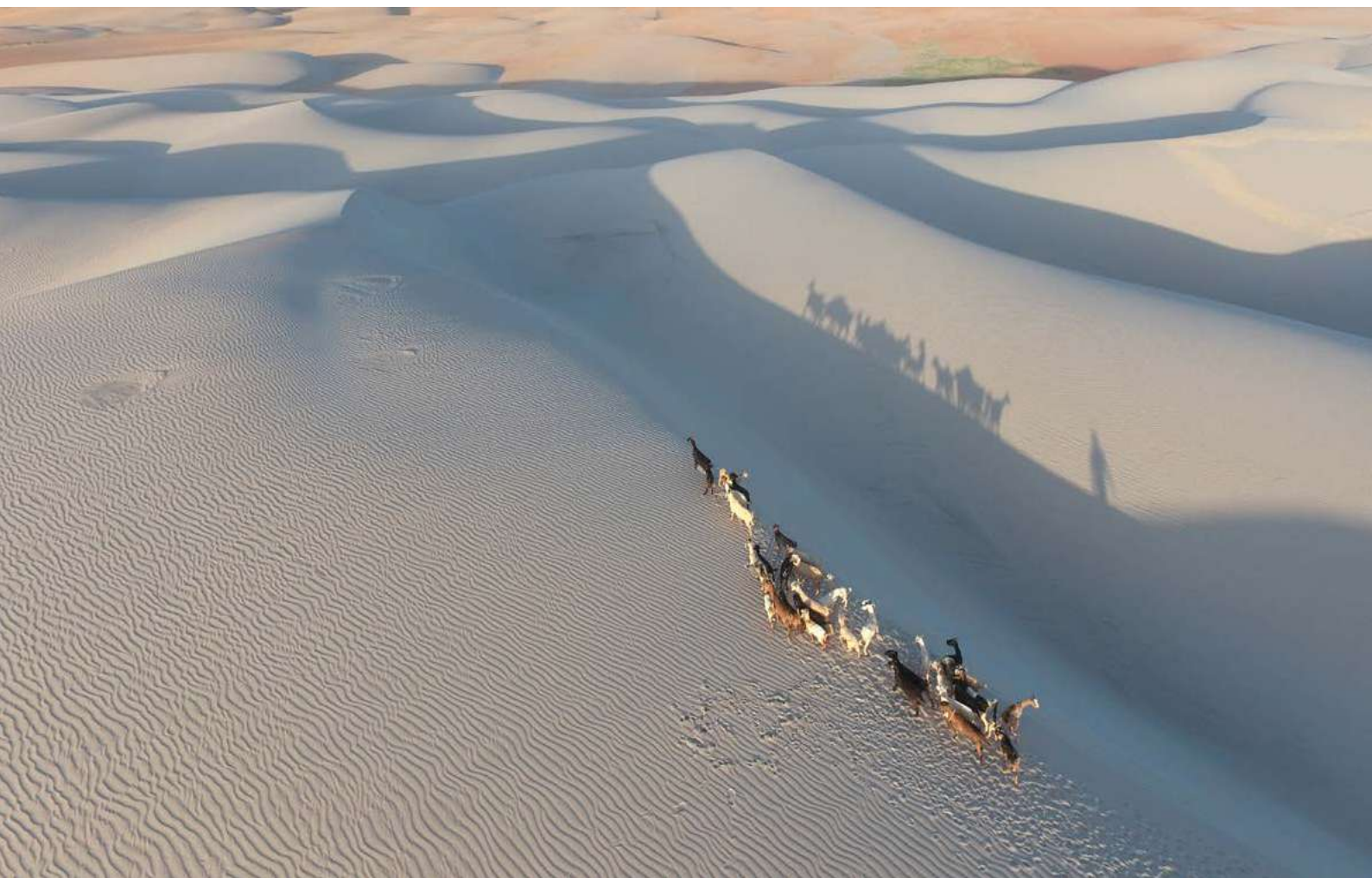
Preparatory Elements (continued)

4. Compiling and communicating national adaptation plans

- *What key development goals can help communities adapt to and reduce risks due to the changing climate?*
- *How can climate and disaster risks to development and potential co-benefits of adaptation and risk reduction efforts and development be identified?*
- *What sectors have already considered risk reduction, risk management and/or resilience building strategies or activities for climate-related hazards and how are these related to NAP objectives?*
- *Are there existing capacities within various sectors in mainstreaming risk reduction and risk management approaches that can enable integration of CCA into sectors?*
- *What barriers exist in the risk governance system to improve links/alignment with National DRR Strategies and how can they be addressed through the design and implementation of NAPs?*
- *Are there comprehensive or integrated risk assessment tools and approaches available in the country that can be used by NAP and DRR/DRM practitioners and planners alike?*

5. Integrating climate change adaptation into national and subnational development and sectoral planning

- *How can the existing risk reduction and management measures within national development plans and sectoral plans be utilized for NAP processes?*
- *How can engagement of DRR/DRM actors contribute to the feasibility and sustainability of proposed adaptation measures (i.e., conducting a joint appraisal of adaptation options by CCA, DRR and other development actors)?*



Steps	Key questions
<i>Implementing Strategies</i>	
1. Prioritizing climate change adaptation in national planning	<ul style="list-style-type: none"> • <i>Are climate-related and disaster risks taken into consideration in defining priority actions in national development plans?</i> • <i>Which tools/approaches for defining risk tolerance and risk classification can be useful in both the NAP and National DRR Strategies?</i> • <i>What are the existing criteria within national development planning and within sectors for defining priority actions in the context of risks to people, economy, and environment?</i> • <i>Which existing disaster risk reduction priorities, including climate risk, within development planning can be used to add long-term climate change adaptation options?</i>
2. Developing a (long-term) national adaptation implementation strategy	<ul style="list-style-type: none"> • <i>How can national adaptation implementation strategies connect with and/or complement disaster risk reduction activities, priorities and strategies?</i> • <i>What incentives can be used to promote integrated resilience building activities by various stakeholders?</i> • <i>What partnerships can be fostered between adaptation and disaster actors, both public and private, to achieve comprehensive action on resilience building?</i>
3. Enhancing capacity for planning and implementing adaptation	<ul style="list-style-type: none"> • <i>How can government agencies be coordinated to achieve coherence between disaster and adaptation efforts across sectors and administrative levels?</i> • <i>How can institutional and regulatory frameworks be strengthened to promote planning and implementation synergies between CCA and DRR/DRM?</i> • <i>What are good practices or lessons learned from the DRR/DRM on planning and implementing risk and vulnerability reduction initiatives can be applicable to adaptation, and vice versa?</i> • <i>What existing financing mechanisms can support both DRR and CCA actions/activities?</i> • <i>How can implementation processes foster the creation of shared values of risk management and enhance public and private sector risk-sensitive investments?</i> • <i>How can implementation processes build on existing city and community level capacities for DRR including to reach to the most vulnerable groups?</i>
4. Promoting coordination and synergy at the regional level and with other multilateral environmental agreements	<ul style="list-style-type: none"> • <i>How can synergies between DRR and CCA be further operationalized at the regional level?</i> • <i>How can risk-centred approaches be implemented vertically and horizontally?</i> • <i>How can the cross-sectoral and regional coordination of adaptation and risk reduction planning be promoted and enhanced?</i>

Steps

Key questions

Reporting, Monitoring and Review

1. Monitoring the NAP process

- *What information and which metrics and mechanisms used for monitoring DRR, the SDGs and other development processes can be used for monitoring NAP process?*

2. Reviewing the NAP process to assess progress, effectiveness and gaps

- *What approaches can be considered/used in assessing progress, effectiveness and gaps in both the NAP and National DRR Strategies to enable strategic analysis in terms of reducing vulnerabilities and aligning efforts?*

3. Iteratively updating the national adaptation plans

- *How can the review process of NAPs, National DRR Strategies and national development plans be synchronized and aligned to ensure harmonization and identification of co-benefits?*

4. Outreach on the NAP process and reporting on progress and effectiveness

- *How can synergies between DRR and CCA be further operationalized at the regional level?*
- *How can risk-centred approaches be implemented vertically and horizontally?*
- *How can the cross-sectoral and regional coordination of adaptation and risk reduction planning be promoted and enhanced?*






FINAL NOTE

Integrating climate and disaster risks into development is a process that requires a long-term outlook, political support and governance capacity. Lessons learned and good practices are emerging on how to best integrate DRR and CCA into development, particularly in the areas of institutional arrangements, climate and disaster risk assessment, implementation of CCA and DRR measures and social and financial protection. There are many ongoing efforts at global and regional levels committed to sharing the local and national level experiences and lessons of various countries.

Despite progress made, much remains to be done; particularly in regard to areas that are critical in the next few years:

- **Capacity building** for the process of developing integrated climate and disaster policies.
- **Breaking institutional silos** by designing a strong governance mechanism to enable the engagement and participation of relevant stakeholders from CCA, DRR and development planning.
- **Investing in tackling data challenges and conducting holistic risk assessments** that serve CCA, DRR and resilience planning.
- **Designing funding schemes and incentivising resilient investments.**
- **Coordinating and monitoring implementation of CCA and DRR integration** into development. 



5

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An aerial photograph showing a large body of water on the left side, transitioning from a dark blue-green to a lighter, rippled greyish-blue. The water's edge is irregular and meets a lush green forest on the right. The forest is dense with various shades of green, and several dead, white tree trunks are visible. The word "ANNEX" is printed in a clean, white, sans-serif font across the middle of the image, overlapping the water and the forest edge.

ANNEX

ANNEX I – A NON-EXHAUSTIVE LIST OF AVAILABLE RESOURCES

COHERENCE OF CCA, DRR AND DEVELOPMENT

- *Opportunities and options for integrating climate change adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015–2030*, Technical Paper of UNFCCC Secretariat, 2017.
https://unfccc.int/sites/default/files/resource/techpaper_adaptation.pdf
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DISASTER RISK DATABASES, RISK ASSESSMENTS, INFORMATION PLATFORMS, AND TOOLS

Global and regional databases, risk assessments and information

- Index for Risk Management (INFORM) tool (EU) - INFORM combines 50 different indicators related to the conditions that lead to crises and disasters. INFORM includes data on the area's human and natural hazard risks, the vulnerability of the communities faced with hazards and the coping capacity of local infrastructure and institutions.
<http://www.inform-index.org/>
- Global Assessment Report (GAR) Atlas Risk Data Platform (UNISDR) - Online tool which shares spatial data information on global risk from natural hazards. It covers tropical cyclones and storm surges, earthquakes, riverine floods and tsunamis.
<http://risk.preventionweb.net/capreviewer/main.jsp?tab=0>
- Think Hazard (GFDRR) - An online tool created by GFDRR to enable non-experts to consider natural hazard information in project design. Users can assess the level of river flood, earthquake, drought, cyclone, coastal flood, tsunami, volcano and landslide hazard.
<http://thinkhazard.org/>
- EMDAT (CRED) - Online database that contains essential core data on the occurrence and effects of over 22,000 mass disasters in the world from 1900 to the present day. The database is compiled from various sources, including UN agencies, non-governmental organisations, insurance companies, research institutes and press agencies.
<http://www.emdat.be/>
- Global Assessment Report (GAR) disaster loss database (UNISDR) - Online database of detailed disaster loss database for 94 countries. These databases are developed at national level.
http://www.desinventar.net/index_www.html
- NatCatSERVICE, maintained by Munich Reinsurance.
<https://www.munichre.com/en/reinsurance/business/non-life/natcatservice/index.html>
- Sigma, maintained by Swiss Reinsurance.
<http://institute.swissre.com/research/overview/sigma/>
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DRR IN SECTORS OR CCA-DRR INTEGRATION IN SECTORS

Agriculture

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<http://www.fao.org/in-action/naps/knowledge-tank/en/>
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- Module on Climate resilience: synergies between Disaster Risk Reduction and Climate-Smart Agriculture in the *second edition Climate-Smart Agriculture Sourcebook*, FAO, 2017.
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- Advancing implementation of the Sendai Framework for Disaster Risk Reduction (2015-2030) through ecosystem solutions by Partnership for Environment and Disaster Risk.
<https://www.preventionweb.net/publications/view/49283>
- UNFCCC synthesis report on *Adaptation planning, implementation and evaluation addressing ecosystems and areas such as water resources*, coordinated by the Nairobi work programme on impacts, vulnerability and adaptation to climate change.
<http://unfccc.int/resource/docs/2017/sbsta/eng/03.pdf>

Health

- Towards Improved Linkage of Disaster Risk Reduction and Climate Change Adaptation in *Health: A Review*, MDPI, 2018.
<http://www.mdpi.com/1660-4601/15/4/793/pdf>

WASH

- *Disaster risk reduction and water, sanitation and hygiene – Comprehensive Guidance*, CARE Nederland and the Global WASH Cluster led by UNICEF.
http://educationcluster.net/wash/wp-content/uploads/sites/5/2013/09/GWC-Disaster_Risk_Reduction_and_WASH1.pdf

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http://iri.columbia.edu/docs/publications/Climate%20and%20Society%20No1_en.pdf
- UNDP-USAID ADAPT Asia's Economics of Adaptation Capacity Building Programme
<http://www.undp-alm.org/projects/ecca>
- UNDP Adaptation Learning Mechanism
<http://www.undp-alm.org/>

INSTITUTIONS WITH PROJECTS, KNOWLEDGE PRODUCTS, AND TOOLS

- Green Climate Fund
<https://www.greenclimate.fund/home>
- IFRC Climate Centre
<https://media.ifrc.org/ifrc/what-we-do/reference-centres/climate-centre/>
- World Bank Global Facility on DRR
<https://www.gfdr.org/publications>
- Partners for Resilience
<https://partnersforresilience.nl/en/>
- Stockholm Environment Institute
<http://www.sei-international.org>
- Capacity for Disaster Risk Reduction Initiative (CADRI)
<https://www.cadri.net/>



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