Framework Convention on
Climate Change

**Least Developed Countries
Expert Group**

29 May 2022

Synthesis report for the technical assessment component of the first global stocktake

Contents

I. Introduction

A. Mandate

1. CMA 1 invited relevant constituted bodies and forums and other institutional arrangements under or serving the Paris Agreement and/or the Convention to prepare for the technical assessment, with the assistance of the secretariat, synthesis reports on the information identified in paragraph 36 of that decision in their areas of expertise.[1]

B. Guiding questions by the SB Chairs

2. The following guiding questions for the technical assessment component of the first global stocktake, on adaptation, were produced by the Chairs of the Subsidiary Bodies as at 18 February 2022:

(a) What is the collective progress in terms of the current implementation of, and ambition in, adaptation actions towards achieving the goals defined in Articles 2.1(b) and 7.1of the Paris Agreement?

(b) With a view to recognizing the adaptation efforts of developing country Parties, what efforts have been undertaken by these Parties towards achieving the goals defined in Articles 2.1(b) and 7.1 of the Paris Agreement, and what existing work can be built upon to facilitate the recognition of those efforts?

(c) How can the implementation of adaptation action towards achieving the goals defined in Articles 2.1(b) and 7.1 of the Paris Agreement be enhanced, taking into account the adaptation communication referred to in paragraph 10 of the Paris Agreement?

(d) How adequate and effective are the current adaptation efforts and the support provided for adaptation towards achieving the goals defined in Articles 2.1(b) and 7.1 of the Paris Agreement?

(e) In order to achieve the goals defined in Articles 2.1(b) and 7.1 of the Paris Agreement:

(i) What further action is required?

(ii) What are the barriers and challenges, and how can they be overcome at national, regional and international levels?

(iii) What are the opportunities, good practices, lessons learned and success stories?

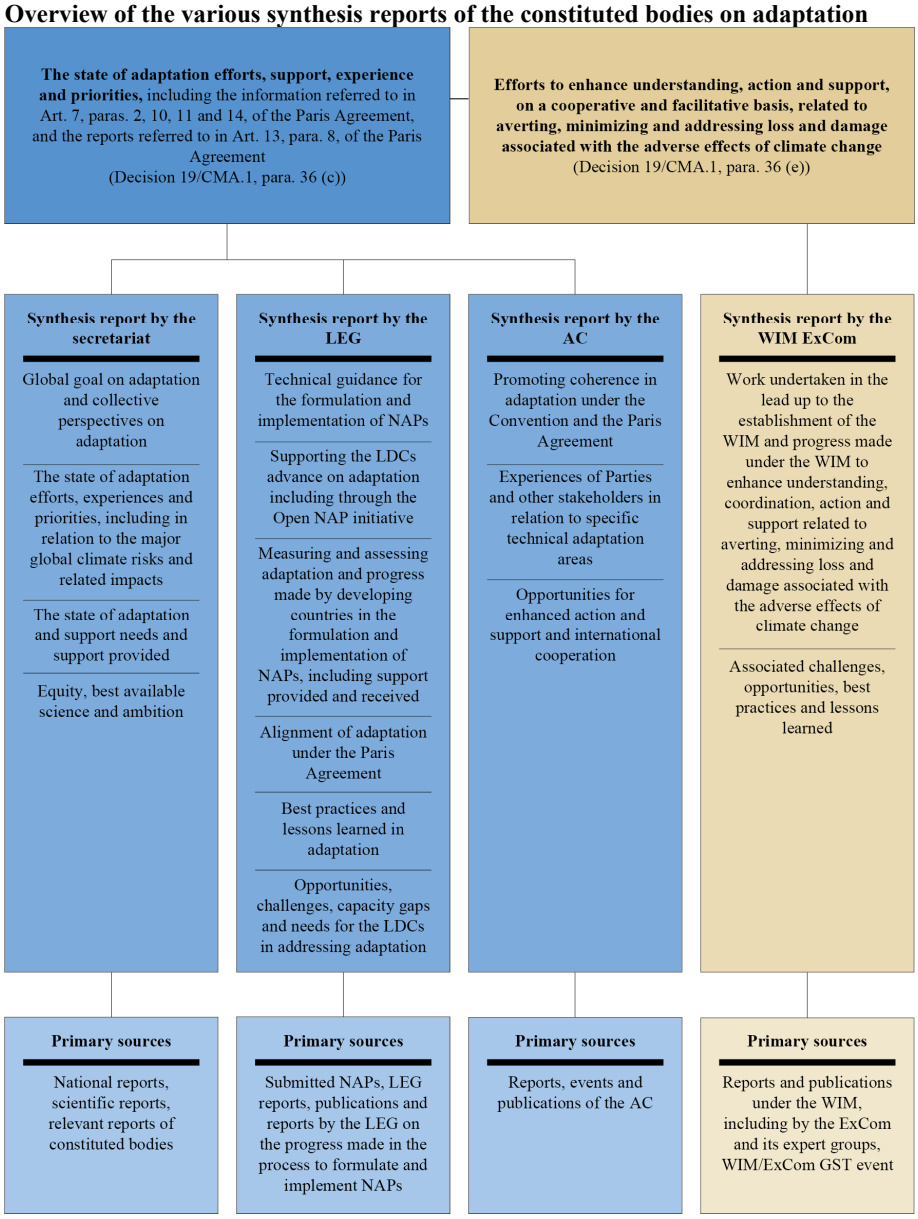
C. Scope

3. This document presents information relevant to adaptation and NAPs in particular, based on the work of the LEG, thereby providing an information basis for the assessment of collective progress made in the context of the global stocktake. For this, the report presents the approaches taken by the LEG in the conduct of its work to advance progress on NAPs, including information on experience, best practices and lessons learned in addressing adaptation and related work on supporting the LDCs on adaptation. Figure 1 below illustrates the LEG synthesis report place in the overall adaptation inputs to the global stocktake.

[1] Decision 19/CMA.1, para. 24.

Figure 1

Overview of the various synthesis reports of the constituted bodies on adaptation



D. The role of the Least Developed Countries Expert Group

4. The LEG was established in 2001 as part of the cluster of adaptation support to the LDCs under the Convention. Over the years, the group has developed and implemented several activities on adaptation by virtue of its mandate to provide technical guidance and support to the LDCs on adaptation. Such support includes the preparation and implementation of the NAPAs and the implementation of the various elements of the LDC work programme under the UNFCCC. The LEG is also the constituted body mandated to provide technical guidance and support to the process to formulate and implement NAPs, including the provision of technical guidance and advice on accessing funding from the GCF for the process to formulate and implement NAPs, in collaboration with the GCF secretariat.

5. The LEG established the NAP technical working group under the 2016 mandate with a goal to provide the best training and support to countries, while ensuring coherence and complementarity, towards achieving a successful process to formulate and implement NAPs.[2]

[2] FCCC/SBI/2016/7, para. 34.

To date, the NAP technical working group provides overall guidance to the technical work being provided to countries on the process to formulate and implement NAPs. It brings together experts and support providers on NAPs to design possible modalities on how to jointly advance technical work on the process to formulate and implement NAPs with a goal to promoting coherence and synergies, ensuring that countries will have the optimum benefit of the technical support.

6. To enhance direct support to the LDCs on their work on NAPs, the LEG established the Open NAP initiative as a way to mobilize wide inputs into the development of a NAP and its implementation for a given country, building on the extensive expertise and scientific research that is sometimes outside the immediate reach of NAP country teams.

II. Technical guidance on the formulation and implementation of national adaptation plans

A. Technical guidelines: A process approach to planning

7. The LEG support to LDCs on adaptation has evolved from one-off planning for urgent and immediate needs such as in the preparation of NAPAs. to a process approach, where activities are iterative, continuous and long-term. While the preparation of NAPAs was designed to produce a NAPA, the NAP process has been designed to create a comprehensive system through which countries can integrate climate change adaptation strategies in developing plans on an ongoing basis.

8. The COP agreed that the NAP process will contain four elements[3] which turned into 17 steps which built on lessons learned and best practices from countries already developing national adaptation plans and strategies. These elements and steps are outlined in the technical guidelines for the NAP process. The steps outlined in the NAP technical guidelines are indicative activities without any logical order and can be done simultaneously by developing countries based on their current national circumstances.

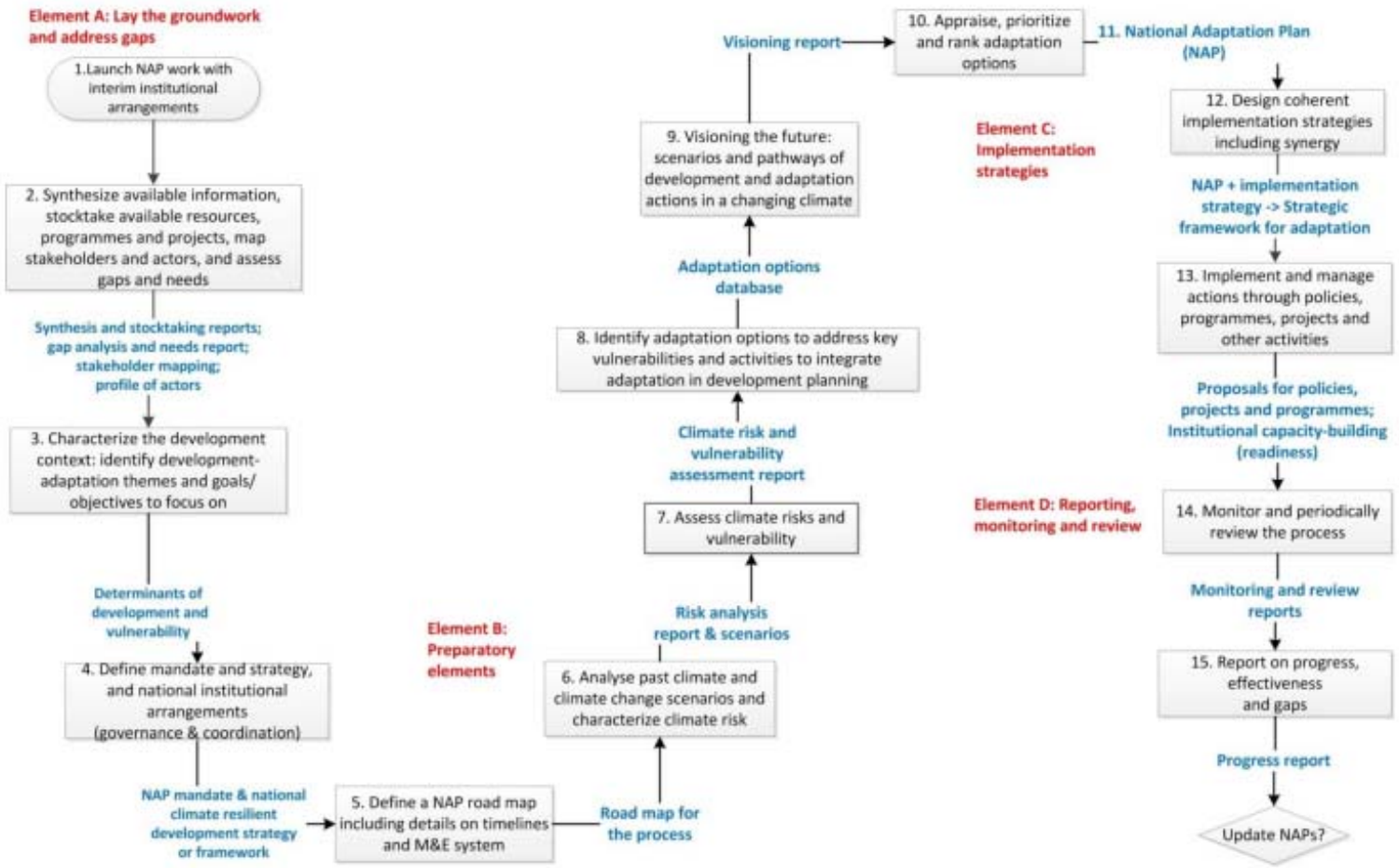
9. In furthering its technical support to countries on the process to formulate and implement NAPs, the LEG developed a sample process to formulate and implement NAPs.[4] The sample NAP shows a typical flow of the main activities, information needs and outputs of the formulation and implementation of NAPs. The LEG used the diagram in Figure 2 to illustrate this logical flow of activities from the launch of the process to the compilation of the NAP and subsequent implementation and reporting on progress.

10. The LEG prepared the outline of a prototype[5] NAP which was used at a training workshop in September 2019 to guide countries in working toward their own NAP. This has been a useful guidance to the countries under the Open NAP initiative as they formulate their first NAP and in transitioning to the implementation phase. The outline also serves a guide as the LEG responds to requests by developing countries in reviewing their draft NAPs.

11. During the course of the regional training workshops on NAPs from 2014 to 2015, the LEG promoted that the institutional arrangements for the process to formulate and implement NAPs could be defined based on a workstreams approach.[6] The actors and stakeholders would be identified to facilitate the division of work and the flow of information between different workstreams. Given the comprehensive and diverse nature of the process to formulate and implement a NAP, it is not practical or advisable for one institution to undertake all activities. Figure 3 shows how the activities of the sample process to formulate and implement a NAP could be assigned to groups of actors along workstreams in a country.

[3] Decision 5/CP.17, para. 6.
[4] FCCC/SBI/2015/INF.14, para. 20-21.
[5] A prototype is an early sample or model of the final NAP that contains all the key elements of the final product and would be expanded to produce the final NAP.
[6] FCCC/SBI/2015/INF.14, para. 24-26.

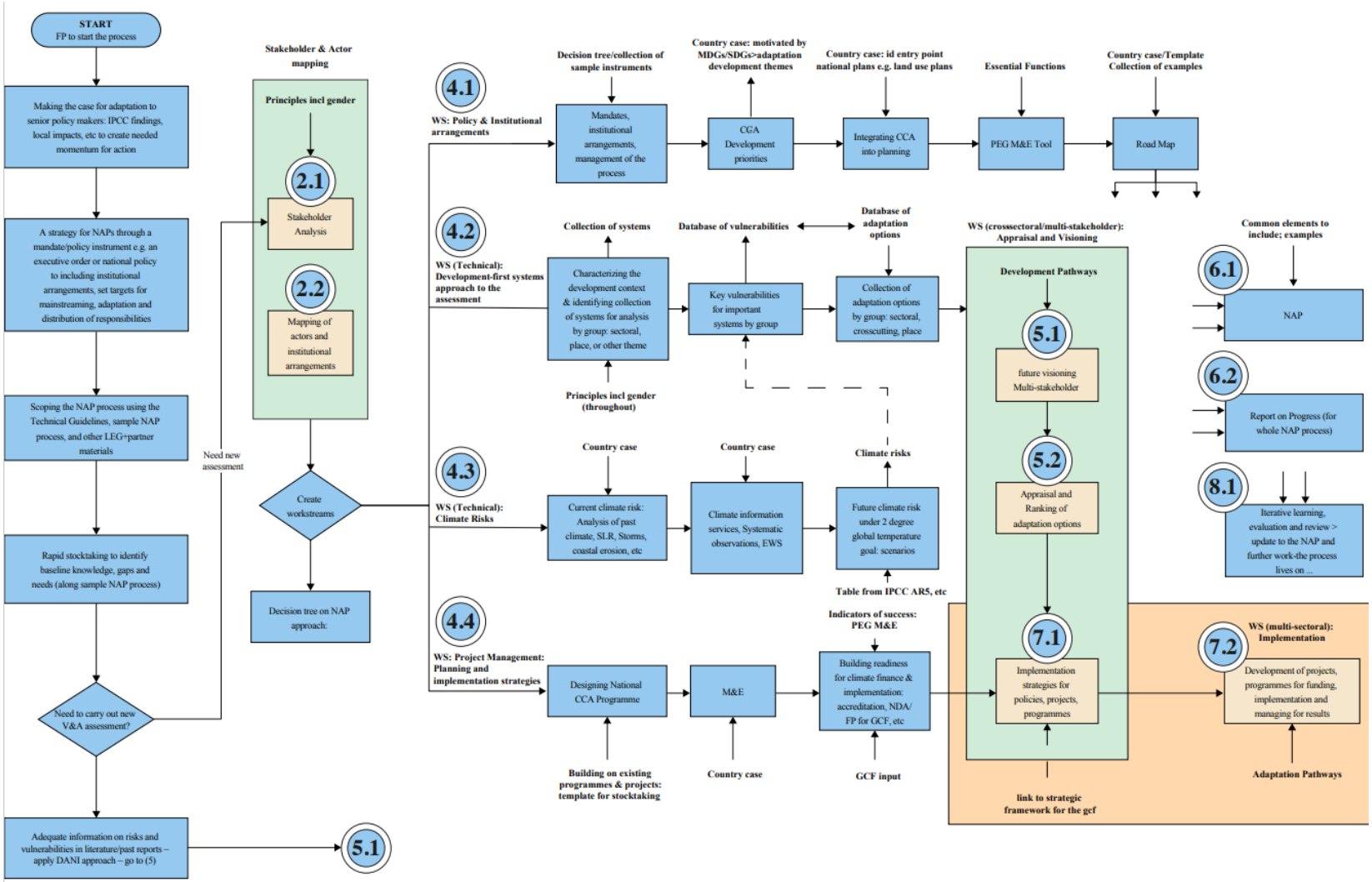
Figure 2
Sample process to formulate and implement a national adaptation plan



Note: Steps and their outputs (in blue) that act as inputs for subsequent steps are shown.
Abbreviations: M&E = monitoring and evaluation, NAP = national adaptation plan.

Figure 3

The workstream approach as designed by the LEG and implemented during the rounds of regional workshops on NAPs from 2014 to 2017[7]



[7] Available at https://unfccc.int/documents/487012.

B. Essential functions of the process to formulate and implement national adaptation plans

12. The LEG established 10 essential functions of the process to formulate and implement NAPs[8] to encapsulate the main expected outcomes of the process. The LEG found that the milestones, products, pay-offs of the process to formulate and implement NAPs can be grouped into the following essential functions. These essential functions are compatible to be used in developing success metrics for the process that is created in countries to support the formulation and implementation of the NAP.

(a) Helping governments to provide national leadership and coordination of adaptation efforts at all levels and to act as the main interface with regional and international mechanisms;

(b) The collection, compilation, processing and dissemination of data, information and knowledge on climate change and relevant development aspects in support of adaptation planning and implementation;

(c) Identifying and addressing gaps and needs related to capacity for the successful design and implementation of adaptation;

(d) Assessing climate-development linkages and needs, and supporting the integration of climate change adaptation into national and subnational development and sectoral planning (through policies, projects and programmes);

(e) Analyzing climate data and assessing vulnerabilities to climate change and identifying adaptation options at the sector, subnational, national and other appropriate levels;

(f) Appraising adaptation options to support decision-making on adaptation investment plans and development planning;

(g) Promoting and facilitating the prioritization of climate change adaptation in national planning;

(h) Facilitating the implementation of adaptation at all levels through appropriate policies, projects and programmes, taking into account opportunities for synergy;

(i) Facilitating the monitoring, review and updating of adaptation plans over time, to ensure progress and effectiveness of adaptation efforts and to demonstrate how gaps are being addressed;

(j) Coordinating reporting and outreach on the process to formulate and implement NAPs to stakeholders nationally, internationally and formally on progress to the Convention.

C. Supplements to the technical guidelines

13. The supplements to the technical guidelines are intended to offer in-depth coverage of selected steps of the process to formulate and implement NAPs. UN agencies and organizations that are supporting developing countries on the process to formulate and implement NAPs are invited to develop these supplementary materials to assist countries in further undertaking necessary methodologies for each of the elements of the process.

14. Since 2013, the LEG has worked together with partner agencies and organizations to disseminate widely its general recommendations for developing supplementary materials to promote common understanding and coherent approaches in developing the materials.

[8] FCCC/SBI/2015/INF.14, table 2.

15. To date, there are at least 36 products which have been shared as supplements to the NAP technical guidelines, covering a wide array of issues that are highly impacted by climate change.[9]

Table 1
List of supplementary materials to the NAP technical guidelines from 2013 to date

Organization(s)	*Supplementary Materials*	*Year*
IFRC	How to Engage with National Adaptation Plans: Guidance for National Red Cross and Red Crescent Societies	2013
CBD	Promoting synergies in addressing biodiversity and climate change adaptation issues: linking national adaptation plans and national biodiversity strategies and action plans	2014
GIZ	Aligning National Adaptation Plan (NAP) Processes to Development and Budget Planning	2014
GIZ	The Stocktaking for National Adaptation Planning (SNAP) Tool	2014
PROVIA	Supporting NAP Development with the PROVIA Guidance: A User Companion	2014
SV	Civil-Society Guide to the LEG/NAP Technical Guidelines	2014
WHO	Guidance to protect health from climate change through health adaptation planning	2014
CI	Tool for integration of ecosystems into climate change adaptation planning processes, DRAFT	2015
GIZ	Guidebook on Developing National Adaptation Monitoring and Evaluation Systems	2015
FAO	Guidelines to Support the Integration of Genetic Diversity into Climate Change Adaptation Planning and NAPs	2015
IPACC	Guidelines towards integrating African Indigenous and Traditional Knowledge in National Adaptation Plans, Platforms and Policies	2015
NAP GSP	National adaptation plan process country-level training- Capacity development for multi-sectoral involvement in the NAP process	2015
SV	Joint Principles for Adaptation; National Adaptation Policy Assessment Tool	2015
UNITAR	Skills assessment for National Adaptation Planning - how countries can identify the gap	2015
WHO	Operation framework for building climate resilient health systems	2015
WMO	Climate Services for Supporting Climate Change Adaptation: Supplement to the Technical Guidelines for the National Adaptation Plan Process	2015
ITU	Information and Communication Technologies for Climate Change Adaptation in Cities	2016
NAP Global Network	Vertical Integration in national adaptation plan processes	2016
IPACC	An Introduction to integrating African Indigenous & Traditional Knowledge in National Adaptation Plans, Programmes of Action, Platforms and Policies	2016
IIED	National adaptation plans: understanding mandates and sharing experiences	2017
FAO	Addressing Agriculture, Forestry and Fisheries in National Adaptation Plans	2017
NAP Global Network	Financing National Adaptation Plan (NAP) Process: Contributing to the achievement of nationally determined contribution (NDC) adaptation goals	2017
CCAFS	10 best bet innovations for adaptation in agriculture: A supplement to the UNFCCC NAP Technical Guidelines	2017

[9] An updated list is available at http://napcentral.org.

Organization(s)	*Supplementary Materials*	*Year*
UN HABITAT	Addressing Urban and Human Settlements Issues in National Adaptation Plans	2018
GWP	Addressing Water in National Adaptation Plans: Water Supplement to the UNFCCC NAP Technical Guidelines	2019
NAP Global Network and UNFCCC	Toolkit for Gender-Responsive Process to Formulate and Implement National Adaptation Plans (NAPs)	2019
UNCDF	Financing Local Adaptation to Climate Change	2019
FAO	Addressing fisheries and aquaculture in National Adaptation Plans Supplement to the UNFCCC NAP Technical Guidelines)	2020
FAO	Addressing forestry and agroforestry in National Adaptation Plans (Supplementary Guidelines)	2020
WHO	Quality criteria for Health National Adaptation Plans	2021
UNDRR	Promoting Synergy and Alignment: Between Climate Change Adaptation and Disaster Risk Reduction in the Context of National Adaptation Plans	2021
CCAFS	Digital agriculture to enable adaptation: A supplement to the UNFCCC NAP Technical Guidelines	2021
WMO	Developing the Climate Science Basis for Climate Action	2021
UNEP	Guidelines for Integrating Ecosystem-based Adaptation into National Adaptation Plans: Supplement to the UNFCCC NAP Technical Guidelines	2021
NAP Global Network	Building Resilience with Nature Maximizing Ecosystem-based Adaptation through National Adaptation Plan processes	2021
Commonwealth Secretariat	Toolkit to Enhance Access to Climate Finance, A Commonwealth Practical Guide	2022

D. A systems approach to adaptation

16. There are many ways of approaching adaptation planning. Common entry points include a climate hazard approach, or a sectoral approach, and in some cases, specific geographic areas – whether the local community level, admin level, river basin, urban area, the whole country or transboundary region. In developing the NAP, many countries asked what the best way would be to approach it, whether to consider cross-cutting issues at the national level first, then develop sectoral plans later, or vice versa. In pondering this question, discussions in the LEG and among technical experts involved in adaptation evolved into a systems approach as the most flexible.

17. Systems thinking is a holistic approach that focuses on how a system's constituent parts interact and interrelate with the other constituents of the system. The different constituents of a system work collectively towards a common outcome. Systems thinking leads to exploring the inter-relationships (context and connections), perspectives (each stakeholder has their own perceptions) and boundaries (agreeing on scope, scale etc.).

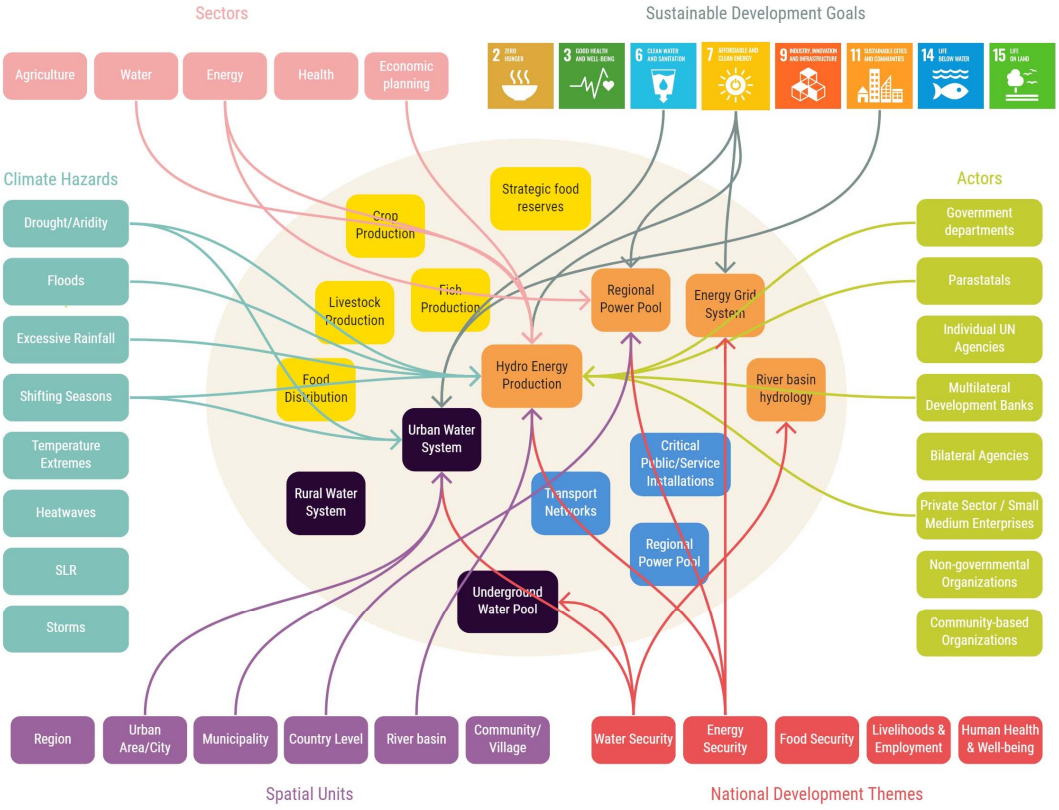
18. While the definition of systems is entirely user-driven, many issues have been well-described in the scientific literature and broken down into components that would serve as basic systems. Further, through an iterative process of looking at what particular hazards impact, it is possible to expand on the list of systems, which may be simple or compound, and may span vast geographic scales beyond the local, such as supply chains that span multiple countries in a region or may even be global in nature. The approach also helps to map which systems would contribute to particular sustainable development goals (SDGs), or any other development strategy, thereby resulting in an approach that manages synergies directly, breaks down silos, and applies best available science from each discipline or sector. Figure 4 illustrates how the mapping can be done for a few systems, in the integrative systems framework that is termed the *NAP-SDG iFrame*. By focusing on the system, it is easy to

identify multiple hazards to consider, different sectors (and corresponding ministries) to include, actors to engage, which SDGs to map to, etc.

19. The NAP-SDG iFrame is being applied in several Open NAP case studies, and in various training workshops on NAPs that the LEG has conducted. The approach offers an intuitive approach to understanding the landscape of adaptation, and participants at the NAP workshop immediately understood the approach and welcomed it.

20. The application of a systems thinking in developing adaptation plans/NAPs allows holistic thinking of different systems which over time will also interact with each other and take on board views of multi stakeholders and actors, resulting in an adaptation plan that is efficient and promotes synergy between sectors, development goals, and consistency across scales and administrative levels.

Figure 4
Illustration of the systems approach through the NAP-SDG iFrame for a few systems covering a few sectors and climate hazards (based on the work of the LEG 2018-2022)



E. Essential functions of the national adaptation plans

21. Over the last few years, the LEG has been receiving requests from some LDCs to review their draft NAPs, including through the partners of the NAP technical working group.

22. In facilitating the review of the draft NAPs, the LEG developed a list of essential functions or the different end uses of the NAPs. The list of essential functions or uses of the NAPs is updated regularly. The current list includes:

(a) Use of the NAP to inform adaptation information included in National Determined Contributions (NDCs) and adaptation communications;

(b) Use of the NAP to inform development of the Green Climate Fund (GCF) country programme with respect to adaptation;

(c) Use of the NAP to guide and drive integration of climate change considerations in development planning including processes such as national budgets;

(d) Use of the NAP to provide an up-to-date summary of key vulnerabilities and risks, and priority adaptation actions for a country;

(e) Use of the NAP to present current and ongoing adaptation activities under implementation under various funding sources, including the Convention funds, bilateral sources, and from national funding sources, for use in recognition of adaptation efforts of developing countries, and also summaries of support provided and support received;

(f) Use of information in the NAP to provide initial information on climate rationale for adaptation, used when designing implementation projects under the GCF and other funds;

(g) Use of the NAP to show how adaptation guiding principles (best practices) are addressed, such as how gender, indigenous knowledge, focus on most vulnerable, inclusion in the planning, etc., are addressed during the formulation of the NAP;

(h) Use of the NAP to provide a platform for promoting coherence with Sustainable Development Goals (SDGs), Sendai Framework for Disaster Risk Reduction and other frameworks; as well as integration across different administrative levels and programmes;

(i) The underlying process for formulating and implementing the NAP is increasingly becoming the umbrella programme for adaptation activities in the country, with a long-term approach to supporting adaptation assessment and planning, and subsequent implementation, and embracing related activities on V&A assessment for national communications, adaptation priority setting for the adaptation communications, activities at sectoral and subnational levels, etc.

(j) There are growing efforts to enhance national institutional arrangements for the leadership and coordination of adaptation efforts at all levels and involving all actors and stakeholders.

F. Regional approaches to adaptation planning

23. COP 21 mandated the LEG to provide technical guidance and advise to LDCs on regional approaches to adaptation planning.[10] As a response, the LEG started to incorporate regional issues and transboundary climate change related risks in the regional training workshop on NAPs conducted since 2017.

24. In response to this mandate, the LEG produced technical paper on regional approaches to adaptation planning and implementation,[11] building on the previously published technical papers on regional synergy in addressing adaptation through NAPAs.[12] The technical paper focuses on transboundary climate change related risks that need to be considered both at the national and regional level; the data needed to facilitate active tracking of transboundary climate change related risks to facilitate evidence-based action; opportunities that exist for regional collaboration in identifying, analysing and managing transboundary climate risks; and policy options that facilitate transboundary cooperation. It also highlights existing programmes and projects that are taking a regional approach as well as strategies for implementing regional approaches to adaptation planning and explores pathways to scale them up and integrate such programmes, projects, and strategies into national efforts.

[10] Decision 19/CP.21, para. 2(b).

[11] Available at https://unfccc.int/files/adaptation/application/pdf/50301_06_unfccc_regional_synergy.pdf.

[12] LEG. 2015. Regional synergy in addressing adaptation through the national adaptation programmes of action and the process to formulate and implement national adaptation plans in the least developed countries. Available at https://unfccc.int/files/adaptation/application/pdf/50301_06_unfccc_regional_synergy.pdf.

Table 2. Examples of regional activities and programmes (source: see footnote 11)

Areas of regional synergy	*Examples of relevant initiatives*
Strengthening the capacity for climate data and information management and facilitating the development of climate change scenarios at the regional level	• Africa Adaptation Programme implemented between 2009 and 2013 provided support to 20 countries in Africa in strengthening capacities in data and information management, institutions and leadership, analysis and implementation, knowledge management, and innovative finance • The Caribbean Community Climate Change Centre (CCCCC),32 provides regional and country-oriented results from climate change modelling and projection experiments online for the Caribbean Member countries. • The Pacific Meteorological Desk Partnership was launched in 2011 as the regional weather and climate services coordination mechanism managed by the SPREP.
Joint impact, vulnerability and adaptation assessments at the regional level	• ICIMOD's Koshi basin programme
Harmonization of adaptation planning and implementation at the regional level	• Lower Mekong Basin Climate Change Adaptation Initiative (CCAI) to guide climate change adaptation planning and implementation through improved strategies and plans • The Pacific Adaptation to Climate Change (PACC) Programme was initiated in 2009 to support 14 Pacific island countries to enhance adaptive capacity on the ground, to drive the mainstreaming of climate risks into national development planning and activities, and to share knowledge in order to build adaptive capacity
Water resources and watershed management along shared river basins	• The Zambezi Watercourse Commission (ZAMCOM) serves as a water management organization for the Zambezi River Basin • The Volta Basin Authority (VBA), formed in 2005, to promote joint approaches to water governance in the basin • Senegal River Basin Authority was created by Mali, Mauritania and Senegal to pool their efforts to master the availability of water and seek means of a rational and coordinated use of the basin's resources
Enhancing adaptive capacity and resilience in mountainous environments	ICIMOD's regional programme on adaptation to climate change is designed to enhance resilience and to support adaptation by vulnerable mountain communities and ecosystems in the Hindu Kush Himalayas region
Conservation of transboundary ecosystems	The Kavango Zambezi Transfrontier Conservation Area (KAZA) was initiated in 2006 to sustainably manage the Kavango Zambezi ecosystem, its heritage and cultural resources based on best conservation and tourism models for the socio-economic well-being of the communities and other stakeholders in and around the eco-region

G. Consideration of vulnerable groups, communities and ecosystems

25. COP 16 mandated the LEG to provide technical guidance and advice on considerations regarding vulnerable communities within LDCs[13] and as a response to this mandate, the LEG initiated the work by developing practical guides on both gender considerations and on vulnerable communities. The gender guide was published in 2016 and is available on NAP Central[14] as part of the supplements to the guidelines for the formulation and implementation of NAPs.

26. In 2019, the LEG, drawing inputs from the partner organizations to the Nairobi work programme on impacts, vulnerability and climate change, developed the technical paper on considerations of vulnerable groups, communities and ecosystems covering cases of diverse actions and efforts for strengthening the consideration of vulnerable groups, communities and ecosystems in adaptation planning and implementation. The case studies cover a variety of societies, regions and biomes, diversity of adaptation actions, project implementation stage, quality of documentation about the case study, and potential scalability to the national level in the context of NAPs.[15]

H. The gender toolkit

27. In 2019, the LEG, together with the AC and the NAP Global Network, produced the toolkit for enabling a gender-responsive approach to the process to formulate and implement NAPs. This was produced as part of the supplement to the NAP technical guidelines.

28. The toolkit is designed to support country efforts to pursue a gender-responsive NAP with a focus on integrating gender considerations into the formulation and implementation of NAPs. It is organized around the key entry points in the NAP process, based on the elements outlined in the UNFCCC Technical Guidelines for the NAP process. It also provides guidance on addressing gender in the enabling activities that facilitate progress and increase effectiveness in the NAP process, including the establishment of institutional arrangements, capacity development, stakeholder engagement, information sharing and securing finance. The toolkit also provides links to key tools for gender-responsive approaches, as well as other useful resources.

Table 3
Examples of gender related actions contained in the NAPs (source: see footnote 14)

Country	*Examples of gender related actions contained in the NAP*
Burkina Faso	Strengthening adaptation and resilience of women's associations and identifying appropriate actions to specific women’s vulnerability
Ethiopia	Application of sex-disaggregated indicators in the adaptation measures
Kiribati	Establishing and enhancing formal mechanisms for gender equality in climate change adaptation governance, including “green” and gender-inclusive businesses, particularly small and medium-sized enterprises

III. Progress on the implementation of the national adaptation programme of actions including lessons learned

29. One of the core mandates of the LEG upon its establishment in 2001 is to support countries in addressing the urgent and immediate needs of the LDCs on climate change

[13] Decision 6/CP.16, para. 2(c).
[14] Available at https://unfccc.int/sites/default/files/resource/NAPGenderToolkit2019.pdf.
[15] Available at https://unfccc.int/sites/default/files/resource/Considerations%20regarding%20vulnerable.pdf.

through the development and implementation of the national adaptation programme of actions (NAPAs).[16]

30. NAPAs are specially established for the LDCs and provide a process for the LDCs to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change. The rationale for NAPAs rests on the limited ability of the LDCs to adapt to the adverse effects of climate change. In the NAPA process, prominence is given to community-level input as an important source of information, recognizing that grassroots communities are the main stakeholders. NAPAs use existing information and no new research is needed. They are action-oriented, country-driven, are flexible and based on national circumstances. The NAPA documents are presented in a simple format, easily understood both by policy-level decision-makers and the public.

31. From 2004 to 2017, 51 Parties that are LDCs[17] had completed and submitted their NAPAs to the secretariat.[18] The main content of the NAPA document is a list of ranked priority adaptation activities/projects, as well as short profiles of each activity, designed to facilitate the development of project proposals for implementation of the NAPA under the LDCF.[19] Project proposals were eligible for funding under the LDCF only if they were part of the list of priority adaptation projects in a submitted NAPA. Each LDC until to date, has equitable access to the LDCF – meaning that each LDC can access an equal amount of funding to other LDCs. Currently, each LDC can access up to USD 20M from the LDCF every 3-year cycle.

32. The LEG regularly takes note of the status of implementation of adaptation projects in national adaptation programmes of action and related strategies and plans supported by the LDCF through the regular update of the GEF secretariat at the meetings of the LEG. [20]

33. At its 41st meeting, the LEG took note of the information provided by the GEF secretariat on the approval by the LDCF/SCCF Council in December 2021 of three full-sized projects (i.e. each receiving more than USD 2 million), accounting for USD 19.62 million in funding. A total of 61 medium- and full-sized projects in 48 LDCs, accounting for USD 436 million, have been approved in the seventh replenishment cycle of the GEF (July 2018 to June 2022). The projects address climate risks in the areas of natural resources management, agriculture and food security, water resources management, and sustainable and resilient economic infrastructure.

34. Over the many years of the preparation and implementation of the NAPAs, the LEG has generated a wealth of information and experience where lessons learned and best practices were derived as compiled in the first two volumes of the best practices and lessons learned publication of the LEG.[21]

35. In particular, it featured country experiences highlighting progress made in LDCs in implementing NAPs and presented best practices and lessons learned along the following areas:[22]

(a) Aligning adaptation planning at the national level through effective institutional arrangements;

(b) Ensuring sustainable adaptation through good national level coordination;

(c) Working with the GEF, its agencies and other stakeholders on adaptation projects and programmes;

---

[16] Decision 5/CP.7.

[17] Four of them, Cabo Verde, Equatorial Guinea, Maldives and Vanuatu have since graduated from the group.

[18] Available at https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/napas-received.

[19] See https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/napa-background.

[20] See https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/ldc-napa-projects.

[21] Available at https://unfccc.int/node/740.

[22] See https://unfccc.int/sites/default/files/resource/BPLL_Volume2_ENG.pdf.

(d) Strengthening the consideration of vulnerability through targeting vulnerable groups;

(e) Documenting the different elements of the national adaptation process;

(f) Monitoring and evaluating adaptation planning and implementation at different levels;

(g) Mobilizing financial resources;

(h) Accessing resources under the Least Developed Countries Fund (LDCF): latest experiences;

(i) Programmatic approaches: tools to address medium- and long-term adaptation needs;

(j) Deploying sectoral approaches at the regional level.

IV. Outreach through the NAP Expos

36. The NAP Expo is an outreach event organized by the LEG under the UNFCCC in collaboration with relevant bodies and organizations. It promotes the exchange of experiences and fostering partnerships between a wide range of actors and stakeholders on how to advance NAPs.

37. Since 2013, when the first ever NAP Expo was launched in Bonn, Germany, there has been six global NAP Expos and three regional NAP Expos held around the world.

38. Every year since its inception, the LEG agrees on an overarching theme for the annual global NAP Expo taking into account the overall objective of raising adaptation ambition by advancing the formulation and implementation of NAPs. The specific objectives include:

(a) To facilitate the interaction between country NAP teams and providers of support, including the GCF, GEF and AF, as well as bilateral agencies and other relevant organizations, to enhance access to financing for NAPs;

(b) To create an interactive global forum on NAPs for countries to share experience, best practices and lessons learned; different organizations and bodies conduct specialized meetings and workshops; and Parties and non-Party stakeholders interact, in advancing the formulation and implementation of NAPs;

(c) To serve as the global platform to advance technical and practical measures towards the production of first NAPs, and their effective implementation.

39. The NAP Expo is considered one of the best practices of the LEG in conducting outreach and in mobilizing wide range of stakeholders in supporting countries for the formulation and implementation of NAPs. The call for expression of interest being organized by the LEG and the secretariat had received unparalleled support over the years. Two governments, Egypt and Korea, have hosted the expos outside of Bonn, Germany, with a third, Botswana having offered to host the expo in 2020 but was postponed due to the COVID-19 pandemic.[23]

40. The NAP Expos enabled Parties and the different stakeholders to share detailed practical experiences on activities related to the elements of the process to formulate and implement NAPs, building on previous such events. Important lessons were drawn on the integration of adaptation into development planning and on various approaches to assessments and implementation strategies. The experiences contributed to the knowledge on the process and informed the design of further technical guidance and support to developing countries in undertaking the process.

41. The NAP Expos also serve as a platform for recognizing adaptation efforts of developing countries, for instance with regard to the formulation and implementation of

[23] The Government of Botswana is in the process of arranging to host the NAP Expo in their country during August 2022.

NAPs and in showcasing best practices and lessons learned on adaptation in specific systems such as food systems, health systems, marine and coastal systems etc.

Table 4. The list of NAP Expos since its launch and the various topics covered under each theme

Year	*Theme*	*Innovative topics and discussions*
NAP Expo 2013	Launching the NAP in LDCs	Role of NAPs in addressing systemic climate change issues
NAP Expo 2014[a]	Catalysing action and support for the national adaptation plan process	• The importance of adaptation in the wider development context and the requirement for ongoing, country-driven NAP support, and the need to integrate climate science with policy and actions. • The climate change risk management perspective alongside the need to understand the climate adaptation challenges
NAP Expo 2015[b]	Realizing the national adaptation plan process	• Flood risks in a changing climate • Successful adaptation to climate change
NAP Expo 2016[c]	Advancing national adaptation plans post-Paris	• Global seed vaults as a climate change adaptation strategy for ensuring food security • Disaster risk reduction as a pillar of a national adaptation strategy • Hydrologic Corridor: restoring the water cycle in Africa
NAP Expo 2018[d]	Advancing national adaptation plans	Keynotes on latest science and approaches on climate change adaptation, presentations from developing and developed countries and relevant experts on experiences, best practices and lessons learned, and information on the formulation and implementation of NAPs
NAP Expo 2019[e]	Raising adaptation ambition by advancing the national adaptation plans	• Successful tools to support adaptation • Landscape architecture solution for a sinking city • Use of artificial intelligence for economic vulnerability assessment
Regional NAP Expo 2017[f]	Strengthening considerations regarding vulnerable communities, groups and ecosystems	Knowledge bases and awareness to support considerations of vulnerable communities, groups and ecosystems in NAPs
Regional NAP Expo 2018[g]	Regional NAP Expo at the 3rd Inter-ministerial Conference on Health and Environment in Africa (IMCHE 3)	The application of the integrative framework for NAPs and SDGs with a focus on health as an entry point of assessment for NAPs

[a] See http://napexpo.org/2014.
[b] *See* http://napexpo.org/2015.
[c] *See* http://napexpo.org/2016.
[d] *See* http://napexpo.org/2018.
[e] *See* http://napexpo.org/2019.
[f] *See* http://napexpo.org/kampala.

[g] *See* https://unfccc.int/event/regional-nap-expo-at-the-3rd-inter-ministerial-conference-on-health-and-environment-in-africa-imche.

V. Monitoring, Measuring, Assessing Adaptation

42. In 2015, the LEG developed the technical paper titled "Monitoring and assessing progress, effectiveness and gaps under the process to formulate and implement National Adaptation Plans: The PEG M&E tool".[24] The tool is developed around five categories of metrics.[25] The five categories are:

(a) Process metrics—courses of action taken to achieve a goal.

(b) Input metrics—tangible quantities put into a process to achieve a goal.

(c) Output metrics—products and services delivered.

(d) Outcome metrics—results that stem from use of the outputs. Unlike output measures, outcomes refer to an event or condition that is external to the program and is of direct importance to the intended beneficiaries (e.g., ministry heads, policy-makers, other stakeholders).

(e) Impact metrics—the effect that an outcome has on something else. Impact metrics are outcomes that focus on long-term societal, economic, or environmental consequences.

43. The PEG M&E Tool presents a set of generic metrics from which a small set can be selected to monitor and assess the whole process to formulate and implement NAPs (see Box below). This set of generic metrics can easily be adjusted and applied to each of the 10 essential functions of the NAP process when monitoring and assessing progress and effectiveness, and in so doing, help identify detailed gaps and needs to further improve the process.

44. The annual progress report on NAPs[26] by the LEG, applies the PEG M&E tool to define measures used to summarize progress being made by each developing country on their process to formulate and implement NAPs.[27]

45. In response to the LDCs increasing requests for technical assistance for developing and including monitoring and evaluation systems in their NAPs, the LEG included this as an important topic during the regional workshops and shared the supplements and other resources that can be recommended to those requesting support.

[24] See https://unfccc.int/files/adaptation/application/pdf/50301_04_unfccc_monitoring_tool.pdf.

[25] Available at https://nap.nationalacademies.org/catalog/11292/thinking-strategically-the-appropriate-use-of-metrics-for-the-climate.

[26] See https://unfccc.int/node/740.

[27] Further work is being undertaken by the LEG to expand the range of measures to also cover adaptation results (outcomes and impacts).

BOX:

GENERAL METRICS FOR THE PROCESS TO FORMULATE AND IMPLEMENT NAPS (based on Box 2 in "Monitoring and assessing progress, effectiveness and gaps under the process to formulate and implement National Adaptation Plans: The PEG M&E tool"[28])

Process Metrics (measure a course of action taken to achieve a goal)

1. Leader with sufficient authority to direct the process to formulate and implement NAPs at the national level and allocate resources to relevant actors, direct planning efforts with participation of all relevant ministries and other stakeholders and facilitate progress for the country.

2. A multi-year plan that includes goals, focused statement of task, implementation, operational research and systematic observations, applications, and integration, such as in the form of a road map.

3. A functioning participatory process in place involving all appropriate stakeholders, with (a) underlying processes and timetables, (b) assessment of progress toward achieving programme goals, and (c) an ability to revisit the plan in light of new advances.

4. A strategy for setting priorities and allocating resources among different elements of the programme (including those that cross agencies), advancing promising avenues of relevant research, piloting and implementation, and roles and responsibilities of the actors.

5. Procedures in place that enable or facilitate the use or understanding of the results by others in the country as well as at the regional and global level (e.g., researchers and practitioners in other disciplines, operational users, decision-makers) and promote partnerships.

Input Metrics (measure available resources to be used by the process to achieve a goal)

1. Sufficient intellectual and technological foundation to support the work.

2. Sufficient commitment of resources (i.e., people, infrastructure, financial etc.) directed specifically to allow the planned programme to be carried out.

3. Sufficient resources to implement and sustain important steps under each essential function.

4. Sufficient resources to promote the development and maintenance of each of the following: (a) human capital; (b) measurement systems, models and tools where relevant, and synthesis and interpretive activities; (c) transition to operational activities where warranted; and (d) services that enable the use of data and information by relevant stakeholders.

5. Activities use existing resources (e.g., regional historical data records, infrastructure, ongoing programmes and projects, and whether the new planning process built on past work).

Output Metrics (measure the products and services delivered)

1. The activities of the process produce peer or publicly-reviewed and broadly accessible results, such as (a) data and information, (b) quantification of important systems and processes, (c) applicable measurement techniques, (d) scenarios and decision support tools, and (e) well-described and demonstrated relationships aimed at improving understanding of processes or enabling forecasting and prediction.

2. An adequate community and infrastructure to support the elements of the process to formulate and implement NAPs has been developed.

3. Appropriate stakeholders judge these results to be sufficient to address needs of the process to formulate and implement NAPs and to inform management and policy decisions.

4. Synthesis and assessment products are created that capture key experiences and lessons learned from carrying out the process to formulate and implement NAPs.

[28] See https://unfccc.int/files/adaptation/application/pdf/50301_04_unfccc_monitoring_tool.pdf.

5. Results and outputs of the process to formulate and implement NAPs are communicated to an appropriate range of stakeholders especially policy- and decision-makers.

Outcome Metrics (measure results that stem from use of the outputs and influence stakeholders outside the programme)

1. The activities under the process to formulate and implement NAPs have engendered significant new avenues of action and resources to address the objectives of adaptation.

2. The element of the process to formulate and implement NAPs has yielded improved understanding, such as (a) more consistent and reliable predictions or forecasts of risks and sources of vulnerability to climate change, (b) increased confidence in our ability to cope and deal with climate change and variability, and (c) broadly accepted conclusions about key issues or relationships.

3. Assessment results and pilot activities have been transitioned to operational use.

4. Institutions and human capacity have been created that can better address a range of related problems and issues in addressing adaptation.

5. The measurements, analysis, and results are being used (a) to answer the high-priority climate adaptation questions that motivated them, (b) to address objectives outside the NAP within broader sustainable development, and/or (c) to support beneficial applications and decision-making, such as forecasting and early warning systems, cost-benefit analysis, or improved assessment and management of risk.

Impact Metrics (measure the long-term societal, economic, or environmental consequences of an outcome)

1. The results of the process to formulate and implement NAPs have informed policy and improved decision-making in the country on adaptation issues and ultimately on development planning.

2. The programme has benefited society in terms of protecting and enhancing economic vitality, promoting environmental stewardship, protecting life and property, and reducing vulnerability to the impacts of climate change.

3. Public understanding of climate adaptation issues has increased.

VI. NAP Central

46. In an effort to provide the LDCs and other developing countries with reliable information on NAPs, the LEG and the secretariat established the NAP Central in 2014. It is an information hub which collates relevant resources and information on the formulation and implementation of NAPs.

47. NAP Central serves as the central repository of submitted NAPs as well as related outputs from developing countries, the UNFCCC technical guidelines on NAPs and the supplements to the NAP technical guidelines, and also provides regular updates on progress on NAPs by developing countries. NAP Central also includes pages implemented on other platforms that cater to specific purposes such as the event pages for NAP Expos and LEG workshops on NAPs, a document repository management, a NAP dashboard, among others.[29] The latest site supersedes an earlier implementation at <http://unfccc.int/nap>.

48. As part of its interactive content, NAP Central includes summaries of NAPs and related dashboards It also showcases a Twitter feed for the NAP Central twitter handle.

49. As part of the ongoing work of the LEG, the NAP Central will soon host geospatial data and related tools for use in assessments, writing of NAPs and design of projects to implement NAPs, as part of the NAP Data Initiative of the LEG (see LEG 41 report). The data and tools are based on open-sources and include use of software such as R-Studio and Python and online file-sharing through the GitHub platform. Use of these tools and platforms greatly facilitates access to data, addressing one of the major gaps identified by most LDCs

[29] See http://napcentral.org.

and other developing countries. A publication mapping available support for NAPs produced by the AC will also be featured on NAP Central, along with additional information on available financial resources for adaptation being produced by the LEG.

VII. Progress made by developing countries in the formulation and implementation of national adaptation plans

A. Overview of the process to formulate and implement national adaptation plans

50. The process to formulate and implement NAPs was established in COP 16 to enable the LDC Parties to formulate and implement NAPs with a view to identifying medium- and long-term adaptation needs and developing and implementing strategies and programmes to address those needs.[30] Other developing country Parties are also invited to employ the modalities formulated to support NAPs.[31]

51. The NAP process has two objectives:[32]

(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.

52. The process to formulate and implement NAPs includes the following four elements, as contained in the initial guidelines for the formulation of NAPs by the LDCs adopted by the COP:[33]

(a) Laying the groundwork and addressing gaps;

(b) Preparatory elements;

(c) Implementation strategies;

(d) Reporting, monitoring and review.

53. The COP requested the LEG to develop the technical guidelines[34] for the process to formulate and implement NAPs on the basis of the initial guidelines,[35] taking into account the four elements listed in paragraph 52 above. The AC reviewed the guidelines and the COP invited developing country Parties that are not LDCs to apply them in accordance with their national circumstances.[36] The guidelines have been supplemented with resources relevant to the process to formulate and implement NAPs, such as tools, methodologies and guidance, developed by the LEG and various organizations.[37]

54. The formulation and implementation of NAPs is guided by the following principles: ensuring a continuous, progressive and iterative process that is not prescriptive; facilitating country-owned, country-driven action; following a gender-sensitive, participatory and transparent approach, taking into consideration vulnerable groups, communities and

[30] Decision 1/CP.16, para. 15.
[31] Decision 1/CP.16, para. 16.
[32] Decision 5/CP.17, para. 1.
[33] Decision 5/CP.17, annex.
[34] LEG. 2012. *National adaptation plans: technical guidelines for the national adaptation plan process*. Bonn: UNFCCC. Available athttps://unfccc.int/topics/adaptation-and-resilience/workstreams/national-adaptation-plans-naps/guidelines-for-national-adaptation-plans-naps.
[35] Decision 5/CP.17, para. 15.
[36] Decision 5/CP.17, para. 29.
[37] Available at http://napcentral.org.

ecosystems; and being based on and guided by the best available science and traditional and indigenous knowledge.[38]

55. Funding related to the formulation and implementation of NAPs is provided through the GCF, the LDCF, the SCCF and other channels. COP 17 approved the governing instrument of the GCF,[39] in which NAPs are identified among the plans to be funded by the GCF. COP 21 requested the GCF to expedite support for the LDCs and other developing country Parties for the formulation of NAPs, consistently with decisions 1/CP.16 and 5/CP.17, and for the subsequent implementation of policies, projects and programmes identified therein.[40] The GCF responded to this mandate for the formulation of NAPs by opening a window for funding under its readiness support. COP 18 mandated the GEF to provide funding for activities to enable the preparation of NAPs through the LDCF for the LDCs and through the SCCF for developing countries that are not LDCs.[41]

56. Technical support is provided by the LEG, other constituted bodies under the Convention, United Nations organizations, specialized agencies and other relevant organizations, as well as by bilateral and multilateral agencies, including through support programmes. Together with relevant organizations, the LEG created the NAP technical working group to advance its work on technical guidance and support for NAPs and to help coordinate activities across all providers of support.

57. Since 2015, the LEG annually updates the information on progress made by developing countries in the process to formulate and implement NAPs and produces a report for the consideration of the SBI at its second intersessional meeting.[42]

B. Overall progress of the process to formulate and implement national adaptation plans

58. The SBI assessed progress in the process to formulate and implement NAPs at SBI 48 (June 2018) and their findings were summarized in document FCCC/SBI/2018/6. The next comprehensive assessment is planned for 2024.

59. As at 31 December 2021, 129 of the 154 developing countries had undertaken at least one activity related to the process to formulate and implement NAPs,[43] 61 of which are being supported by the GCF in formulating their NAPs.[44] Figure 5 below provides the overall picture of where the countries are at in terms of process. It also illustrates disaggregated numbers between LDCs and other developing countries.

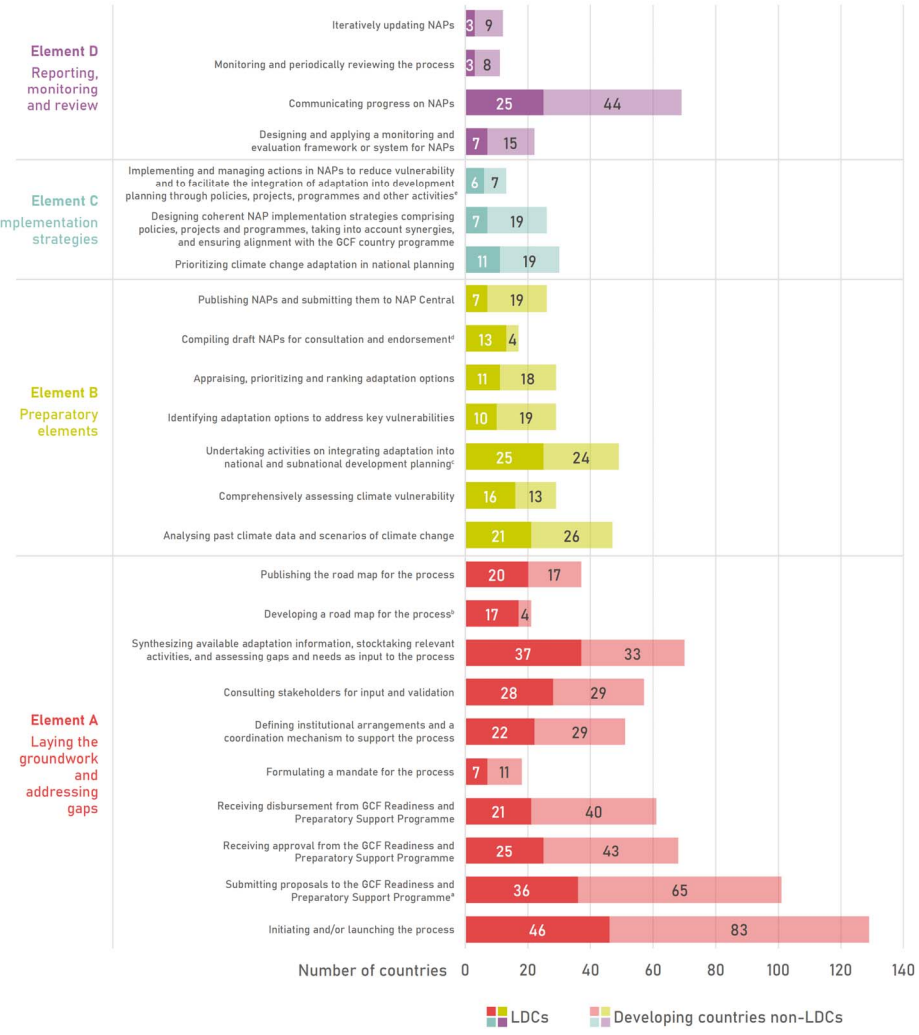
60. As at 5 May 2022, 35 countries (of which 13 are LDCs) had completed preparation of their NAPs and had shared them on NAP Central.[45] Some countries had developed and submitted sectoral and thematic strategies and other relevant outputs.[46]

61. One of the outcomes of climate change efforts such as the process to formulate and implement NAPs is the ability of countries to implement adaptation actions. One indicator of that outcome is the ability to access climate finance through the GCF. Figures 6a and 6b show how the LDCs and other developing countries are accessing funding from the GCF through data that cover adaptation and mitigation projects. Besides a majority of the LDCs not having succeeded in accessing significant resources under the GCF and in many cases only for

[38] Decision 5/CP.17, paras. 2–4.
[39] Decision 3/CP.17, para. 2.
[40] Decision 1/CP.21, para. 46.
[41] Decision 12/CP.18, paras. 1 and 4.
[42] FCCC/SBI/2015/INF.11, FCCC/SBI/2016/INF.11, FCCC/SBI/2017/INF.11, FCCC/SBI/2018/INF.13, FCCC/SBI/2019/INF.15, FCCC/SBI/2020/INF.13/Rev.1/, FCCC/SBI/2021/INF.7.
[43] FCCC/SBI/2021/INF.7.
[44] Countries for which funds from the GCF have been disbursed; see table 3 for further details. A total of 62 proposals are reflected in table 3, as one country had two approved proposals.
[45] See http://napcentral.org/.
[46] See http://napcentral.org/.

readiness activities, LDCs lag behind other developing countries in success rates and amounts, despite their being most vulnerable.

Figure 5
Measures undertaken by least developed countries and other developing country Parties in the process to formulate and implement NAPs[a]



[a]Note: This table provides an update to table 1 in document FCCC/SBI/2020/INF.13. A list of the Parties that have undertaken these measures is available at http://unfccc.int/9295. The total number of developing countries is 154.

a) Other countries have received either partial or full support from bilateral and other sources for the formulation of their NAPs.

b) Countries that have completed the road map were removed, which resulted in a decrease from the number listed in the previous report.

c) Activities considered were those reported and cited by countries that were undertaken within the context of the process to formulate and implement NAPs.

d) Countries that have published their NAPs and submitted them to NAP Central were removed, which resulted in a decrease from the number listed in the previous report.

e) Activities considered in this measure pertain to policies, projects and programmes identified in the NAPs.

Figure 6a

Total funding accessed by each least developed country under the Green Climate Fund as displayed on country pages of the Green Climate Fund website as at 30 September 2021 (source: FCCC/SBI/2021/INF.7)

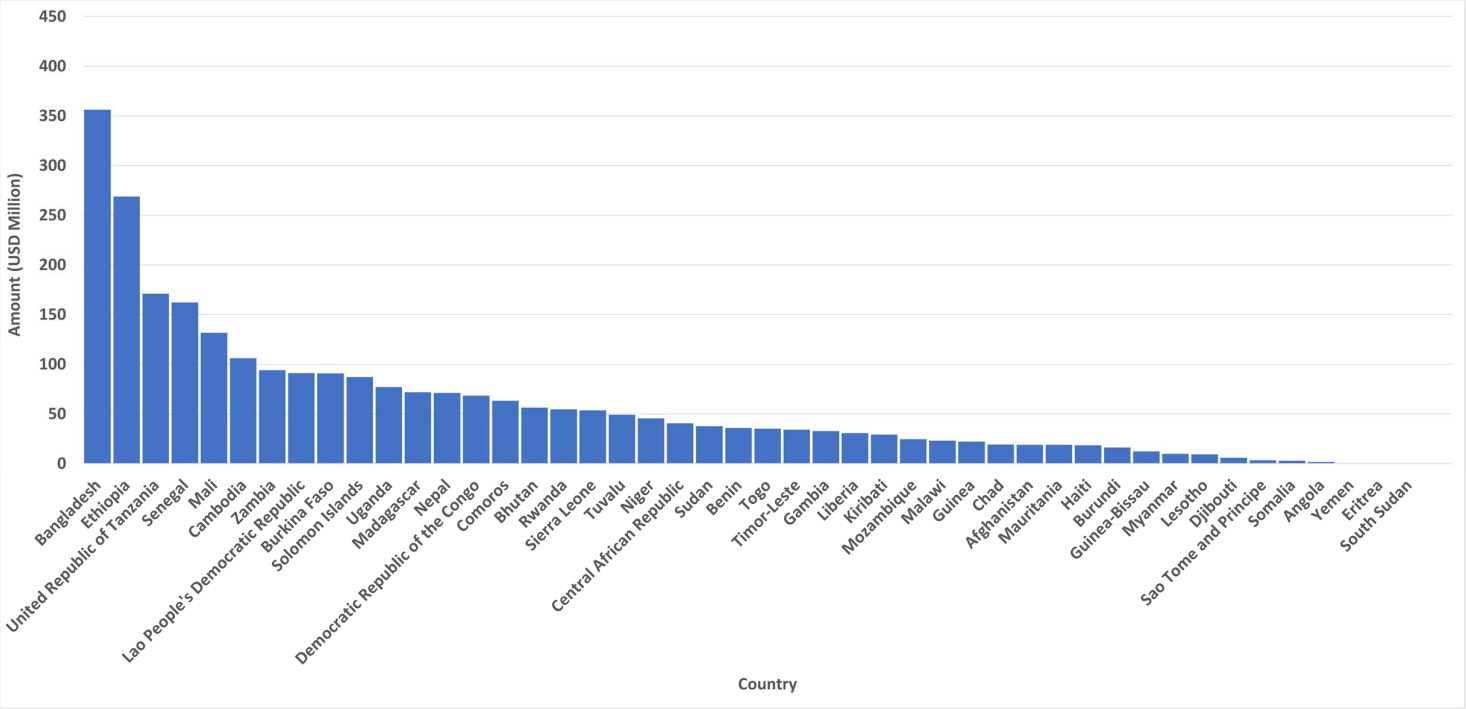
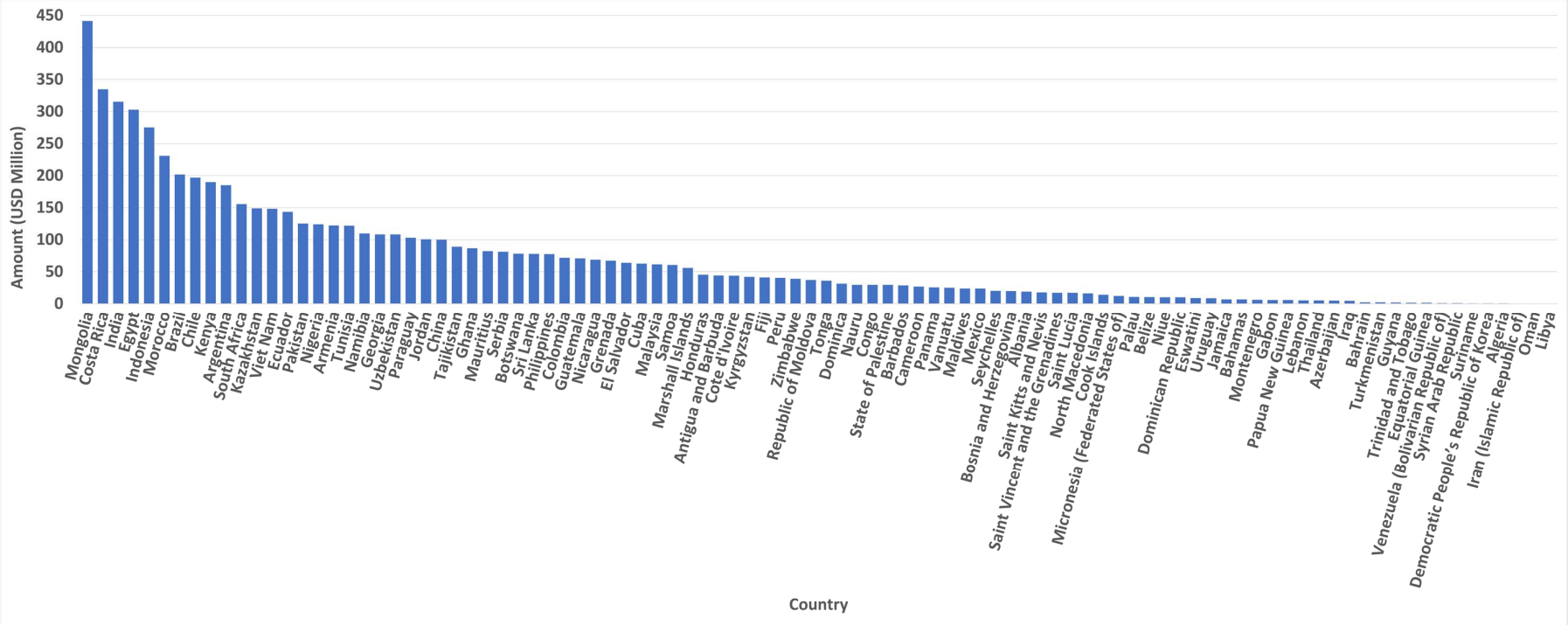


Figure 6b

Total funding accessed by developing counties that are not least developed countries under the Green Climate Fund as displayed on country pages of the Green Climate Fund website as at 30 September 2021 (source: FCCC/SBI/2021/INF.7)



C. Synthesis of submitted national adaptation plans

62. Summary data for 34 NAPs, those submitted as at 15 March 2022, were compiled and analysed to look at the general overview and trends in terms of key hazards being addressed and the typologies of adaptation actions being planned and implemented to address the key hazards and vulnerabilities.

63. The information presented here offer a basis for analysis of emerging trends and how else to present the results to address questions that may arise as part of the global stocktake, in addition to informing future technical guidance and support by the LEG to the LDCs in further formulation of NAPs and the development of projects for implementation.

1. Formulation and timelines of national adaptation plans

64. The formulation of NAPs is most commonly led by government agencies focused on climate affairs, and finance or economic development agencies often hold a major role as well. In most countries, these organizations already existed, but some formed committees specifically for the establishment of the process to formulate and implement NAPs, including the development of a NAP. For example, Grenada re-established its National Climate Change Committee to provide guidance and coordination throughout the process to formulate and implement NAPs.

65. Pre-existing national climate response policies serve as a strong starting point for NAPs. A key feature of NAPs is their capacity to update, integrate, and expand upon climate response work that is in progress. Some countries did not refer to existing national policies as informants of NAP development but others referred to state-level development plans. As in the case of Sudan from among the LDCs.,

66. Of the many countries that specify an implementation timeframe within their NAPs, some identified 2030 as a key date for accomplishing NAP goals and some of these countries aligned their NAPs with the targets they set out in achieving their SDGs. Most of these countries published their NAPs between 2017 and 2020, presenting a 10- to 13-year implementation horizon.

2. Overview of goals and visions in the national adaptation plans

67. While decision 5/CP.17 outlines the objectives and guiding principles of the process to formulate and implement NAPs, countries also define their own goals within the NAP. Most are oriented around reducing overall vulnerability to climate change, and through a review of the goals, visions, and guiding principles described in NAPs, the following themes were identified to be prominent:

(a) Integration of climate-oriented programming across government agencies and policies;

(b) Climate-resilient and sustainable development;

(c) Prioritization of vulnerable subpopulations;

(d) Resource mobilization and access to funding;

(e) Stakeholder empowerment through partnerships and information-sharing;

(f) Building technical and/or professional capacity to address climate change;

(g) Management and organization of knowledge about climate change and national vulnerabilities;

(h) Addressing sector-specific needs;

(i) Preparing to meet adaptation and mitigation timelines laid out in other documents.

68. Most NAPs emphasized inclusion of women, indigenous groups, and/or youth as a goal or guiding principle. In most cases, NAPs referred to supporting vulnerable groups in general within their aims, but some prioritized specific subpopulations. For example, "gender sensitivity" is a guiding principle in the formulation and implementation of some NAPs.

69. Other goals were broader, such as those related to encouraging sustainability in economic development initiatives, a topic addressed by many countries in their NAPs.

3. Key hazards, risks, and vulnerabilities in the national adaptation plans

70. Each NAP lays out the particular risks and hazards facing the country. In total, 17 hazards were identified as being addressed by two or more of the total submitted NAPs.

71. The common hazards that were identified are: floods, droughts, increasing temperatures, sea level rise, and vector- and water-borne diseases. Across these risk factors, there appears to be little to no regional variation. All are addressed by at least one of the five regions represented in the data set. Sea level rise had the most regional variation, as it was mentioned by all Pacific and Caribbean Islands, as well as the two Middle Eastern states, but not all countries in South America and Africa.

72. Regional variation was apparent in several other risk factors. For example, cyclones and typhoons were major concerns for all six island states in both the Pacific and Caribbean but were not mentioned by other countries. Island states also expressed more concerns about storm surges. South American countries had the most concerns about land and forest degradation, representing 4 of the 6 countries for which this was a key hazard.

4. Implementation strategy and resource mobilization

73. Countries either used NAPs as an opportunity to estimate costs and set up a budget for adaptation, or they mentioned plans to evaluate costs in the future. Some countries provided cost estimates to implement their NAPs. These estimates were broken down either by cost per sector or cost per adaptation initiative.

74. In terms of financing, most countries indicated that national funds would support some portion of NAP programming, while some plans to seek government funds in the future. To complement the national funds, some countries expressed confidence in international financing.

75. Most of the NAPs indicated plans to access funding the Green Climate Fund to implement the adaptation priorities identified in their NAPs.

5. Types of adaptation actions

76. In profiling the submitted NAPs, it showed that agriculture, infrastructure and spatial planning, health, water resources, ecosystem services, forestry, fisheries, education, livestock, coastal zones and disaster risk reduction are the key systems common to all. Some NAPs identified tourism, urban areas, mining and industry as part of their adaptation priorities.

77. Countries varied in their approaches to proposing adaptation actions, as well as the number of actions proposed. Some countries provided short-term, mid-term, and long-term plans for sectors or resources in need of protection while others did not distinguish between related actions based on timeframe.

6. Progress in implementation

78. Most of the strategies identified by the countries in terms of implementing the programmes and projects identified in their NAPs are through external funding and one of the main targets is accessing the various funding windows under the GCF.

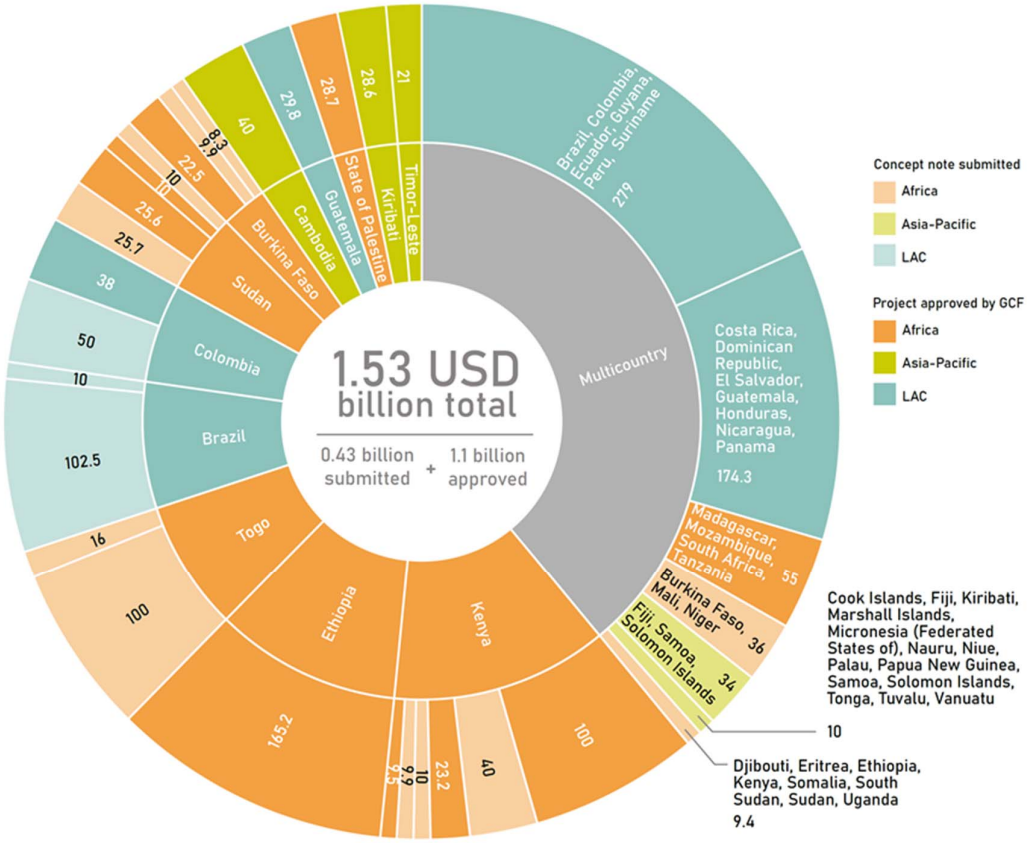
79. As of 25 April 2022, 11 of the 13 LDCs that had submitted NAPs had also prepared and submitted a total of 17 proposals for accessing funding from the GCF for implementing priority actions identified therein. The proposals relate to addressing climate risks in the areas of agriculture, energy, health and water resources. Proposals from eight LDCs (Burkina Faso, Cambodia, Ethiopia, Kiribati, Liberia, Nepal, the Sudan and Timor-Leste have been approved for funding by the GCF).[47]

80. For all developing countries, thirteen countries have received approval to access funding from the GCF for implementing 16 of the 32 proposals for the priority projects identified in their NAPs. The total GCF funding (grants and loans) for these projects amounts to USD 1.53 billion. Figure 7 below shows the distribution of projects (both in the concept note stage and approved stage) per country.

[47] LEG 41 Report, document FCCC/SBI/2022/6, paragraph 12. See also Table 2 of the same report for the list of projects submitted to the GCF and their funding status.

Figure 7

Amount of funding accessed by developing countries for the implementation of the projects and programmes in the national adaptation plans from the Green Climate Fund as at 14 October 2021 (in millions of United States dollars)



7. Analysis of GCF Projects

81. Part of its work in providing technical support to the LDCs in accessing the GCF for funding support, the LEG conducts a regular analysis of projects approved by the GCF. This provides an indication of the types of projects and programmes and the sectors and systems being addressed. The project documents are also a useful resource for learning about implementation strategies and innovative financing arrangements being applied in different countries and region

82. As at 30 April 2022, of the 130 approved projects on adaptation and cross-cutting themes, 70 percent are in Africa and Asian-Pacific regions, with the remaining portfolio supporting Latin America and the Caribbean, Eastern Europe and global projects.

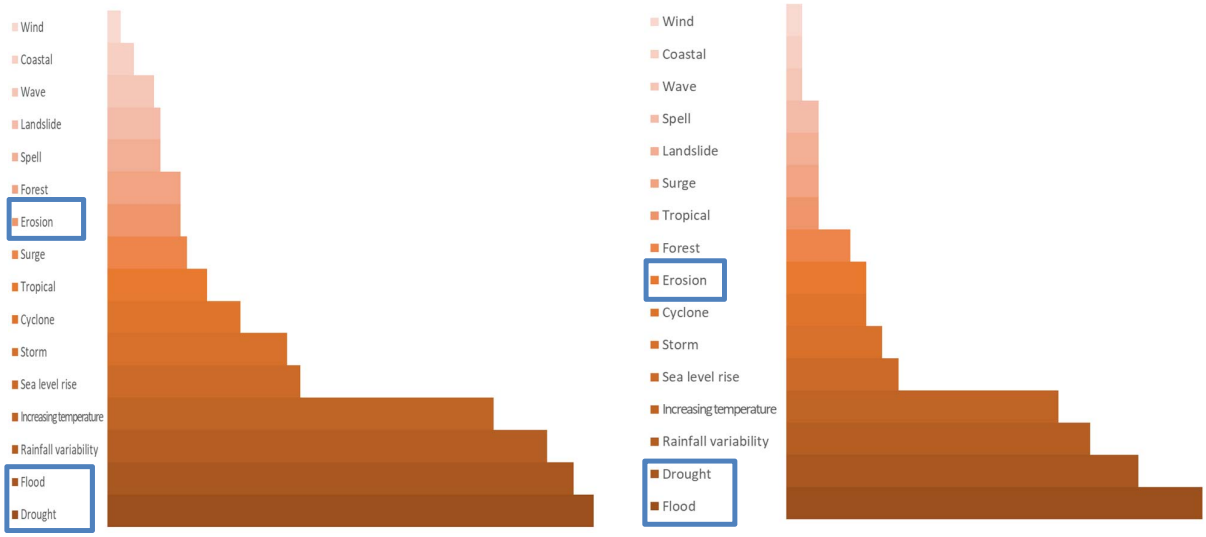
83. The analysis also shows that most projects are responding to these prioritized result areas: Livelihoods of people and communities, health, food and water security and ecosystems and ecosystem services.

84. The projects mentioned in paragraph 77 above are addressing majority of these climate hazards such as: droughts, floods, and slow onset climate impacts (climate variabilities related to temperature and precipitation). See Figure 8 for further details. The hazards highlighted in boxes show major differences between LDCs and the all developing

countries – with floods ranking higher in the LDCs, and also erosion, compared to the aggregate figures.

Figure 8

Overall primary climate hazards in the GCF projects (left) and primary climate hazards for the LDCs only (right), based on analysis of GCF projects under implementation as of 30 April 2022



VIII. Advancing formulation of national adaptation plans through the Open NAP initiative as a direct country support

85. The LEG launched the Open NAP initiative[48] in 2017 and the proof of concept has been tested in several rounds of regional workshops on NAPs.

86. The Open NAP initiative as direct support modality of the LEG which provides the platform to mobilize the widest inputs from all interested and available actors and stakeholders for the formulation of NAPs for a given country. It builds on collective experience, expertise and capacity that exists in the adaptation community, to produce NAPs, in many cases the first NAP, as efficiently as possible.

87. SBI 51 welcomed the information provided by the LEG on Open NAPs and invited Parties and interested organizations to participate in the Open NAP initiative in order to contribute to the success of the process to formulate and implement NAPs.[49]

88. Currently, 18 countries are being supported under the Open NAP initiative and each country is at different stages in the formulation of its NAP.

89. Under the Open NAP initiative, some countries have been assisted to assemble available information which has led to the development of draft NAPs and its components; identification of key risks, hazards and vulnerabilities; and technical analysis of climate change information.

IX. Mobilizing support for NAPs through the NAP technical working group

90. The LEG is also mandated by the COP to engage a wide range of organizations in implementing the work programme of the LEG.[50] Following these mandates, the LEG conducted a number of activities through meetings, workshops and technical work such as the production of supplementary materials to the NAP technical guidelines and the sample NAP process, engaging the UN organizations and specialized agencies, regional networks and centres as well as bilateral and multilateral agencies. The LEG worked together with the organizations through ad-hoc arrangements that included online exchanges and working sessions during the negotiating sessions. In order to maintain continuity and consistency of the work, especially in developing technical methods and tools, the LEG and the organizations proposed the formation of the NAP technical working group.

91. The NAP technical working group provides overall guidance to the technical work being provided to countries on the process to formulate and implement NAPs. It brings together experts and support providers on NAPs to design possible modalities on how to jointly advance technical work on the process to formulate and implement NAPs with a goal to promoting coherence and synergies, ensuring that countries will have the optimum benefit of the technical support.

92. The NAP technical working group is consisting of bodies, organizations, regional centres and networks that provide technical support to developing countries on the process to formulate and implement NAPs. The working group meets at the margins of the intersessional meetings. It also meets on a need basis i.e., during the preparations for NAP Expo and other relevant events.

93. Currently, the NAP technical working group provides complementary support to the LEG in advancing the formulation of NAPs in LDCs and in conducting NAP Expos.

[48] Available at https://unfccc.int/sites/default/files/resource/opennapbrief.pdf.
[49] FCCC/SBI/2019/20, para. 51.
[50] Decision 6/CP.16, para. 5.

X. LDC work programme

A. Updated LDC work programme

94. The LDC work programme that was adopted at COP 7 in 2001[51] guided the support to the LDCs including the priorities for funding under the LDCF until its update in 2018.

95. The updated work programme[52] was adopted at COP 24 in December 2018 and contains the following elements:

(a) Strengthening and/or establishing, national climate change secretariats or focal points to enable the effective implementation of the Convention, the Kyoto Protocol and the Paris Agreement in the least developed country Parties;

(b) Providing training in negotiating skills and language to develop the capacity of negotiators from the LDCs to participate effectively in the climate change process;

(c) Supporting the process to formulate and implement NAPs and related relevant adaptation strategies, including national adaptation programmes of action (NAPAs);

(d) Supporting the preparation and implementation of successive nationally determined contributions (NDCs);

(e) Promoting public awareness programmes to ensure the dissemination of information on climate change issues;

(f) Strengthening cooperative action on adaptation technology development and transfer;

(g) Strengthening the capacity of meteorological and hydrological services to collect, analyze, model, interpret and disseminate weather and climate information to support the implementation of adaptation actions;

(h) Supporting capacity-building initiatives to enable effective engagement in reporting and review activities under the Convention and the Paris Agreement.

96. The work programme serves as an overall framework for targeting and channelling support to the LDCs by different actors. To this end, the work programme has enabled the LDCs to put in place measures to address climate change. For example, all the LDCs have prepared their NAPAs, which contain priority interventions for adapting local communities and systems to the adverse effects of climate change. All the countries are actively implementing urgent and immediate measures identified in the NAPAs with funding from the LDCF.

B. Interface with the OHRLLS and the LDC Programme of Action

97. The priorities for support to the LDCs under the Convention and Paris Agreement in the LDC work programme complement the broader priorities for support to the LDCs under the United Nations through the Programme of Action for the LDCs for each decade. The current one is the Doha Programme of Action (DPOA) for 2021 to 2031, adopted in 2022. The DPOA is coordinated through the UN OHRLLS.

98. The LEG maintains its interface with the OHRLLS by inviting the High Representative in its high-level events such as the NAP Country Platform and relevant events and vice versa. The LEG, through the secretariat, provides regular updates on climate change in the context of the implementation of the successive LDC Programmes of Action.

[51] Decision 5/CP.7.
[52] Decision 16/CP.24.

99. The LEG and the secretariat are working with the OHRLLS on the climate change and disaster risk reduction elements for the LDC 5 Conference.[53]

C. Regular interaction with the LDCs

100. The LEG makes it a priority to regularly update the LDCs of its work in providing support to the LDCs on adaptation. The following activities are included in the LEG work programme to achieve this purpose:

(a) Regular side events on the work of the LEG in supporting LDCs on adaptation including update on priority activities, gaps and needs and support provided and received by LDCs at the subsidiary body sessions;

(b) Information event on the work of the LEG at special events such as during the Climate Dialogues.

101. Every after COP, the LEG develops a newsletter compiling relevant outcomes from the COP and upcoming activities for the year. The newsletter is communicated to the LDC Group Chair for dissemination to its respective constituents.

102. The NAP Expo is another platform where the LEG updates the LDCs of recent developments on its technical products. The LDCs in turn use the NAP Expo as a channel to share their adaptation efforts.

D. Regular interactions with the LDC Group

103. The interaction with the LDC Group Chair during the LEG meetings is one of the main channels that facilitates regular dialogues between the two important bodies promoting the welfare of the LDCs on climate action. The report of the forty first meeting of the LEG contains the latest agreed synergies of the two bodies.[54]

104. The LEG also ensures to include the LDC Group Chair during its high-level events at the COP and at NAP Expos.

E. PA-ALIGN

105. In response to the COP mandate to support the LDCs in addressing the needs arising from the Paris Agreement,[55] the LEG introduced the concept of the tool PA-ALIGN.

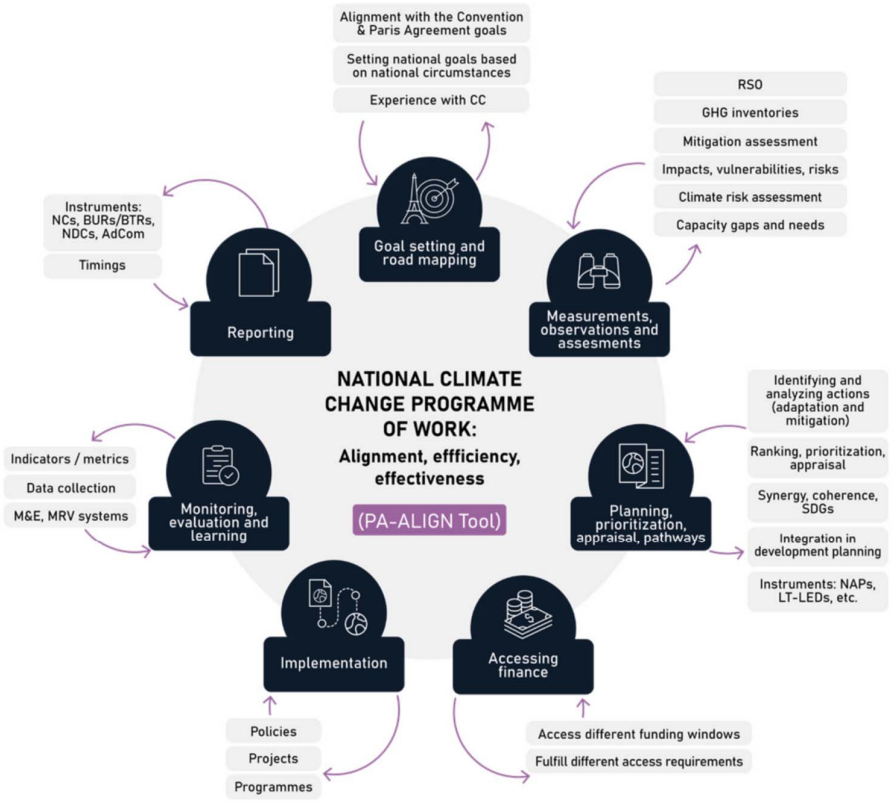
106. PA-ALIGN is a training course designed by the LEG with inputs from other constituted bodies and relevant organizations which aims to efficiently and effectively navigate and address the many elements of the Paris Agreement with a focus on opportunities, obligations and reporting requirements for different groups of Parties, and in particular the LDCs.

107. The course is part of the LEG activities on implementing the LDC work programme. Established in 2001, the LDC work programme is based on Article 4, paragraph 9 of the Convention, requiring Parties to take full account of the specific needs and special situations of the LDCs regarding funding and transfer of technology. It serves as an overarching framework for targeting and channelling support to the LDCs under the Convention and the Paris Agreement.

[53] See https://www.un.org/ldc5/.
[54] FCCC/SBI/2022/6, paras. 84 to 85.
[55] Decision 19/CP.21, para. 2(d).

Figure 9

National climate change programme of work: alignment, efficiency, effectiveness (PA-ALIGN Tool)



XI. Mobilizing national expertise

108. At the core of the Open NAP initiative (see section VIII above) as a direct country support to countries, the LEG mobilizes national expertise to provide support to countries in advancing the activities on formulating and implementing NAPs.

109. The modality was introduced as a way to boost and harness local expertise owing to their knowledge of the national circumstance. These experts have regular interaction with the LEG and the secretariat to ensure consistency and alignment in approaches.

110. The practice was proven to be successful during the COVID-19 pandemic when international consultants could not travel to LDCs due to travel restrictions. Those with national experts could still advance most of the activities without being hampered by travel restrictions. The LEG is in the process of launching a roster of LDC Experts, which will be made available to all those that provide support to adaptation in the LDCs to further expand the use of endogenous expertise.

XII. Work on capacity gaps and needs related to NAPs

111. At its 35th meeting, the LEG initiated the compilation of gaps and needs related to the process to formulate and implement NAPs in response to decision 8/CP.24, paragraph 17.[56]

112. It resulted into a compilation of gaps and needs[57] whereby the LEG structured the compilation into needs – or the expected competencies, skills or services at the national, subnational and sectoral levels in the countries – for the formulation and implementation of NAPs. The LEG then conducted a rapid assessment of whether the gaps associated with the needs are present in all LDCs (as well as developing countries) or in some.

113. Since then, the LEG has regularly conducted an analysis of activities in its work programme for related to addressing gaps and needs. The LEG has also invited the NAP technical working group and relevant organizations to provide inputs on their activities related to addressing gaps and needs.

114. The compiled gaps and needs referred to in paragraph 112 above make a distinction between needs, which are essential capacities necessary for an effective process to formulate and implement NAPs, and gaps, which indicate the absence or lack of such capacities.

115. At its 41st meeting, the LEG identified the following areas of support which address the priority needs of the LDCs:

(a) Direct country support to ensure progress in the formulation and implementation of NAPs;

(b) Enhanced support for the LDCs for accessing funding from the GCF, and other sources, for formulating and implementing NAPs;

(c) Support for activities that address the two objectives of the process to formulate and implement NAPs (reducing vulnerability to climate change and integrating NAPs into national development plans) and that ensure linkages with action towards the global goal on adaptation;

(d) Improved support for the LDCs in addressing the guiding principles for NAPs;

(e) Support for efforts to address data and technical challenges associated with the identified gaps and needs related to the process to formulate and implement NAPs;

(f) Support for efforts to promote coherence of reporting and action in relation to adaptation under the Convention and the Paris Agreement.

XIII. Supporting the CMA: adequacy and effectiveness of adaptation and support provided for adaptation

116. COP 21 requested the AC and the LEG to undertake three tasks in order to assist in the implementation of the Paris Agreement, with outputs to be considered by the CMA at its first session. One of the requests was to, jointly with the SCF and other relevant institutions, develop methodologies and make recommendations on reviewing the adequacy and effectiveness of adaptation and support referred to in Article 7, paragraph 14 (c), of the Paris Agreement.[58]

117. In addressing this mandate, the AC and LEG collected information through a desk review, submissions from Parties and other stakeholders, including from the SCF, and events organized on the margins of United Nations climate change conferences. Based on the

[56] Decision 8/CP.24, para. 17.
[57] Contained in document FCCC/SBI/2019/16, annex I.
[58] Decision 1/CP.21, para. 45.

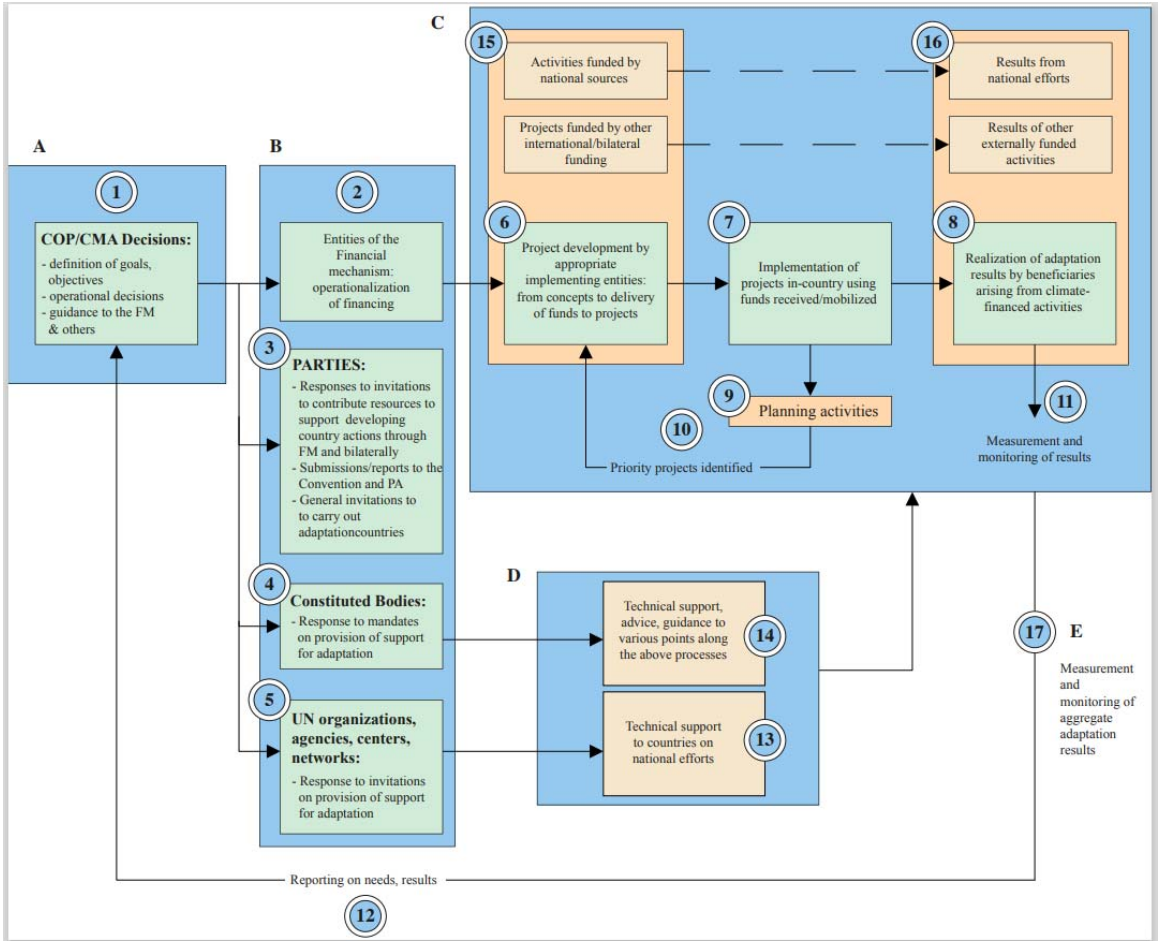
information the AC and the LEG provided recommendations to the CMA through their respective reports.

118. CMA 1 considered the recommendations, noted that the current state of knowledge was not sufficient to address the mandate and invited Parties, academia and other stakeholders to undertake further technical work, building on the existing work of the AC, LEG and SCF. It further invited the AC and the LEG, in collaboration with the SCF, and relevant experts to contribute to the technical work by continuing to compile existing methodologies.

119. The AC and the LEG at their 20th and 40th meetings respectively agreed to establish a joint working group, in collaboration with the SCF, to advice on further work regarding the mandate.

Figure 10

Conceptual framework to understanding the work on assessing the adequacy and effectiveness of support to adaptation[59]



[59] Available at https://unfccc.int/documents/487011.

XIV. Support provided by the LEG for the formulation and implementation of national adaptation plans

120. The LEG is the constituted body mandated by the COP to provide technical guidance and support to LDCs on NAPs. The core of its work programme is dedicated to ensuring that LDCs are able to advance the formulation and implementation of NAPs. The LEG produced the technical guidelines for the NAP process (NAP technical guidelines) in 2012, in response to a mandate from COP 17, based on initial guidelines for the formulation of NAPs in the LDCs.[60] The NAP technical guidelines are subsequently used by all developing countries.

121. The LEG employs various modalities in supporting LDCs in advancing the work on NAPs, including:

(a) Development of technical guidelines, supplements and other technical materials;[61]

(b) Training workshop for advancing the formulation and implementation of NAPs;[62]

(c) Writing workshops to advance formulation of NAPs and project concept notes for implementation of NAPs;

(d) NAP Central;[63]

(e) NAP Expos;[64]

(f) The Open NAP initiative as a direct country support;[65]

(g) Mobilizing various partners through the NAP technical working group;[66]

(h) Collaboration with other constituted bodies under the UNFCCC.

122. The NAP technical working group is composed of bodies, organizations, regional centres and networks that provide technical support to developing countries on the process to formulate and implement NAPs. The LEG collects information from the group as part of its annual report on the progress made by developing countries on NAPs. Since the last reporting period, the following typologies of activities are being implemented as part of the support of the NAP technical working group:

(a) Supporting countries in accessing funding for the formulation of NAPs under the GCF preparatory and support programme window;

(b) Developing supplements, guidance notes and other technical resources on various elements and steps of the NAP process;

(c) Mobilizing national stakeholders for a multi-stakeholder engagement for the formulation and implementation of NAPs;

(d) Developing methods to use available high-resolution earth observational data in the formulation and implementation of NAPs, including the monitoring of relevant metrics that tract adaptation success;

[60] Decision 5/CP.17, annex.
[61] Available at http://napexpo.org/ecosystem/resources.
[62] See http://napexpo.org/workshops/africanap2022/.
[63] See http://napcentral.org.
[64] See http://napexpo.org/2019.
[65] See http://napexpo.org/ecosystem/opennaps.
[66] See https://unfccc.int/topics/adaptation-and-resilience/workstreams/national-adaptation-plans-naps/nap-technical-working-group.

(e) Implementing support programmes that provides capacity building and other enabling activities for advancing adaptation actions.

XV. Experiences, best practices and lessons learned in addressing adaptation in the developing countries

123. Through its 20 years of experience in supporting the LDCs from planning to implementation of adaptation actions, the LEG regularly compiles experiences, good practices and lessons learned which serves as a valuable resource to countries as they navigate their own adaptation planning and implementation process.

124. The following examples are generated from the submitted NAPs:

(a) The formulation of NAPs is most commonly led by government agencies that are mandated to coordinate on climate affairs and finance. Economic development agencies often hold a major role as well in the formulation aspect. In most countries, these organizations already existed, but some formed committees specifically for coordinating the process of formulating and implementing a NAP. For example, Grenada re-established its National Climate Change Committee to provide guidance and coordination throughout the formulation and implementation of the NAP.

(b) Existing national climate response policies serve as a strong starting point for NAPs. A key feature of NAPs is their capacity to update, integrate, and expand upon climate response work that is in progress.

(c) Regarding planning horizon of the NAPs, countries specify implementation timeframe within their NAPs, some identified 2030 as a key date for accomplishing NAP goals while others aligned their NAPs with the 2030 Agenda on Sustainable Development. Most of the countries with submitted NAPs published their NAPs between 2017 and 2020, presenting a 10- to 13-year implementation horizon.

(d) The NAP serves as a key vehicle to articulate and communicate the key risks and vulnerabilities of the country and then identifying the priority adaptation actions that address those risks and vulnerabilities. The synthesis of the NAPs outlines the key hazards and risks being addressed by most of the countries based on the regional characteristics.

(e) As part of the implementation strategy, most NAPs identified costs of the adaptation priorities and actions indicated in the NAPs. These estimates were broken down either by cost per sector or cost per adaptation initiative.

(f) Countries consistently identify international financing as a way to implement their NAP whether by grant or multilateral financing. The Green Climate Fund is one of the key financing entities being identified by countries in the implementation of the NAPs. Countries indicated that national funds would also support some aspects of the NAP programming.

125. As part of its support to the LDCs on adaptation, the LEG continuously captures and shares best practices and lessons learned by the LDCs as they undertake their work on addressing the impacts of climate change. These are periodically compiled and published in a best practices and lessons learned publication and now on its fourth volume.

126. The second and first volumes focus on national adaptation programmes of actions and the LDC work programme.

127. The third volume focuses on the early experiences of developing countries in the process to formulate and implement NAPs.

128. The fourth volume focuses on adaptation actions clustered into key systems such as food and agriculture systems, water systems, infrastructure and health system. It promotes

the idea of looking at the various climate change impacts as a system approach and similarly compels a decision-maker to look at actions across a network of system.

129. Some of the best practices and lessons learned identified in the fourth volume are:

(a) Agriculture and food security system – The Strategic Program for Climate Resilience (SPCR) in Cambodia is an investment plan approved by the government and funded by the Climate Investment Funds' Pilot Program for Climate Resilience. It includes seven investment projects aimed to strengthen the country's rural and urban infrastructure and agriculture development, including irrigation, seeding, and post-harvest activities. It also included an $11 million technical assistance program, which concluded in June 2021 and showcased approaches the government can adopt to integrate climate resilience into development planning.

(b) Energy security system – The programme on Support for the Economic Independence of Women in Rural Mali Facing Food Insecurity and Climate Change has 13 pilot units across three regions of Mali (Koulikoro, Ségou and Mopti) and around Bamako. The women received training and solar- and gas-powered equipment allowing them to produce and market local products. In addition, 5000 households were contacted and equipped with improved stoves in 13 townships.

(c) Water resources and management system – The Mekong River Water Utilization Project will assist the member states of the Mekong River Commission (MRC); Cambodia, Laos, Thailand and Vietnam to establish mechanisms to promote and improve coordinated and sustainable water management in the Basin including reasonable and equitable water utilization by the countries of the Basin and protection of the environmental aquatic life and ecological balance.

(d) Life safety: health and human well-being system – The Climate Smart Healthcare publication provides an array of tools, methods, and case studies from around the world on climate-smart healthcare which aims to strengthen health sectors and communities by ensuring access to clean and independent energy, safe water, clean transport, and clean waste disposal mechanisms. It will stimulate the development and supply of sustainable products, while also preparing the sector for a future of known and unknown health-related climate hazards.

(e) Coastal zone system – The project on Community Based Adaptation to climate change through coastal afforestation in Bangladesh implemented multiple climate change adaptation interventions in four pilot coastal sites, focusing on restoration and replanting of degraded mangrove and wetland areas. The project resulted in the creation of paid work opportunities for community members while generating multiple socio-economic and environmental benefits.

(f) Economic planning and activities system – The Local Climate Adaptive Living Facility (LoCAL) has been operating in countries in Africa (Benin, Ghana, Mali, Mozambique, Niger and Tanzania), Asia (Bangladesh, Bhutan, Cambodia, Loa PDR and Nepal) and the Pacific (Tuvalu) totaling to 12 countries. LoCAL combines performance-based climate resilience grants (PBCRGs) with technical and capacity-building support. PBCRGs ensure programming and verification of climate change expenditures at the local level and offer strong incentives for general performance improvements targeting areas of importance for enhanced resilience.

(g) Human settlements/housing system – The Saint Louis Emergency Recovery and Resilience Project aims to help reduce the population's vulnerability to coastal hazards along the Langue de Barbarie and to strengthen the urban and coastal resilience planning of Saint Louis, a city registered as a World Heritage Site by UNESCO. The five-year project has adopted an inclusive, participatory approach to plans for the relocation of the affected communities by ensuring the active involvement of local communities throughout the project cycle. This is intended to strengthen existing community networks, promote the sense of

ownership and solidarity within communities, and provide an opportunity to build overall community resilience to future disaster risks and climate change.

(h) General ecosystems and unique biodiversity system – The project Biodiversity Conservation at Sapo National Park in Liberia has a long-term goal of contributing to the establishment and sustainability of Sapo National Park as the flagship protected area of Liberia. This project's five-year development objective is to consolidate management and development of Sapo national Park and peripheral communal forests as part of landscape-level development.

(i) Infrastructure system – The project Enhancing Resilience of Vulnerable Coastal Areas and Communities to Climate Change in the Republic of Gambia will restore and maintain 2,500 ha of mangrove's forests of Tanbi Wetlands (of which 177,285 Gambian depends directly or indirectly on their economic activities, its buffer zones, sewage sinks and coastal stabilization roles), through a co-management approach to act as an additional buffer against climate-induced pressures in coastal areas. These mangroves are to complement hard physical measures designed to protect lowland rice growing and economic investment in coastal areas (fish landing sites, hotels) and will be implemented alongside these hard measures through participatory planning. Climate resilient wetland and fisheries management strategies will be introduced and transferred to vulnerable communities.

XVI. Opportunities for advancing the formulation and implementation of national adaptation plans in the least developed countries

130. The support for the formulation of NAPs is currently accessed through the GCF Readiness and Preparatory Support Programme whereby countries can access up to USD 3 million per country for the formulation of the NAP. The readiness programme grant cycle involves seven stages, starting from conceptualization and development, submission, review and appraisal, approval, legal processing and first disbursement, implementation, monitoring and reporting to finally completion and grant closure. One of the criteria for approval includes the articulation of theory of change, clear roles actors and stakeholders, including evidences that would ensure stakeholder consultation, potentials for private sector engagement and gender consideration. The GCF follows a very strict monitoring system for the NAP readiness support and ensures due diligence of IEs. Periodic checks are made to ensure successful outcomes of the projects. This shows that GCF-funded NAP formulation projects will produce NAPs that have received careful oversight by the GCF support system.

131. The full alignment of the implementation strategy for the NAP with the GCF country programme will facilitate effective engagement with the GCF and provide a strong basis for implementation of the NAP including through other Convention funds as well as financial support from other sources. The elaboration of priority project profiles in the NAP including provision of adequate detail to support development of concept notes for engaging with the GCF, is considered a good practice. While most NAPs do not provide details of anticipated costs for implementing the identified activities and projects, the GCF provides technical assistance to countries upon request, to further elaborate the project ideas.

132. The Open NAP initiative of the LEG is a direct support modality of the LEG which provides the platform to mobilize the widest inputs from all interested and available actors and stakeholders for the formulation of NAPs for a given country. It builds on collective experience, expertise and capacity that exists in the adaptation community, to produce NAPs, in many cases the first NAP, as efficiently as possible.

133. The NAP Data Initiative (NDI) by the LEG addresses data gaps in the LDCs to support vulnerability and risk analysis, and the important analyses needed in project proposals to provide the climate rationale for adaptation actions. The initiative provides navigation to readily available data and data platforms and goes further by enabling the direct integration

of results of data analysis into documents. This capability to dynamically integrate results of analysis and updated re-analysis when new data becomes available into documents such as the NAP, facilitates the creation of "live documents" that are always up to date.

134. The NAP formulation process entails countries providing a strong climate rationale for each of the adaptation option they suggest, especially if they are seeking financial support from the GCF. Although this requirement is often fulfilled, most of the climate assessments used in the NAPs are often borrowed from external or regional assessments, which may be already out of date or context. Additionally, there are huge gaps in national climate data provision, often due to lack or breakdown of observation equipment, or lack of historical observations altogether.

135. The NDI seeks to address this gap by providing a catalogue of global datasets that can be used in place of missing national observations, as well as technical guides with details on how to access the data and apply it to form a strong science rationale for adaptation. This is achieved by utilizing a set of open-source data tools such as R& RStudio and python to perform statistical analyses, GitHub and Netlify, among others, to collaborate/co-produce and disseminate products. Open access global datasets are either harvested and stored locally or accessed directly from source into the R/python environment, and passed through data analysis routines to generate trends, indices and other relevant data outputs. These are then integrated into the NAPs and other reports or documents, in an electronic format and can be shared and co-authored by multiple stakeholders. The (co) authoring architecture is set up such that changes are updated dynamically and with excellent version control capabilities. The NDI is implemented under the Open NAP initiative, and currently supports 6 countries, including Malawi, Mozambique, Lesotho, Sao Tome and Principe, Sierra Leone and Comoros.

XVII. Concluding remarks

136. Since 2001, the LDCs have made steady progress in addressing their urgent and immediate adaptation needs by implementing NAPAs through the LDCF. All LDCs completed and submitted their NAPAs to the UNFCCC secretariat. They were used by the GEF in assessing eligibility for support for implementing adaptation projects from the LDCF. A total of 61 medium- and full-sized projects in 48 LDCs, accounting for USD 436 million, have been approved in the seventh replenishment cycle of the GEF (from July 2018 to June 2022). The projects address climate risks in the areas of natural resources management, agriculture and food security, water resources management, and sustainable and resilient economic infrastructure.

137. The LDCs are also making progress in formulating NAPs: 13 of 46 have completed and submitted a NAP on NAP Central as at 30 April 2022; most of the other LDCs have started formulating their NAPs with support from the GCF Readiness and Preparatory Support Programme, while 6 LDCs have yet to access GCF support.

138. The LDCs that submitted a NAP have started to implement their priorities. Of the 13 that submitted a NAP, 11 had submitted a total of 17 proposals for funding from the GCF, and proposals from 8 LDCs had been approved for funding as at 30 April 2022.

139. The numerous best practices for and lessons learned from funded adaptation projects should remain a valuable resource for LDCs when developing proposals for adaptation projects.

140. Given only 13 of the 46 LDCs have submitted a NAP, this compilation of adaptation needs in the LDCs is not very representative. Information other than that contained in submitted NAPAs and NAPs could help to demonstrate a fuller scale of adaptation needs in the LDCs. The LEG is preparing an information paper based on sources of information additional to the formal reports to capture a more complete statement of adaptation needs in the LDCs, to be finalized at its second meeting in 2022.

Annex

Compilation of hazards, risks and proposed adaptation options from the submitted national adaptation plans from LDCs as at 30 April 2022

Country	*System/Sector*	*Hazards*	*Impacts/Risks*	*Proposed Adaptation Options*
Burkina Faso	Agriculture	Increasing Evapotranspiration; Droughts	Faster soil degradation, Desertification	Recover degraded land by means of sub-soiling and reforestation; Implement water and soil conservation and soil defence and restoration techniques; Implement sustainable land management (SLM).
Burkina Faso	Agriculture	Increasing Temperatures; Shifting Precipitation Patterns	Reduced crop yields, Reduced food stocks	Adopt production-driven systems (intensification of production); Use adapted varieties (production of short-cycle seeds); Improve land tenure security as a basis for land conservation and management; Promote water-saving irrigation systems; Promote off-season farming practices (market gardening and irrigated crops); Increase storage capacities (reservoirs/storage tanks, rainwater basins etc.); Adapt irrigation systems to take account of evapotranspiration phenomena in water bodies along the perimeters of developed areas,
Burkina Faso	Livestock production	Droughts	Shortages of grazing, reduction in agricultural production, outbreaks of animal diseases, pastoral conflicts	Fight bush fires in order to prevent destruction of dry-season grazing reserves; Adopt best animal husbandry and pastoral practices (pastoral hydraulics, pastoral resource management, pasture mowing and conservation, pasture crops, silage, animal mobility and transhumance etc.); Ensure stakeholders take account of climate variability in development project and programme planning by improving their skills; Preserve cattle breeding at serious risk from climate variability; Ensure farmers adopt animal production methods adapted to a hot climate; Promote lasting social peace by reducing tensions relating to pastoral conflict; Ensure that the main pastoral warning systems are operational.
Burkina Faso	Environment and natural resources	Increasing Temperatures; Increasing Evapotranspiration; Floods	Ecosystem and biodiversity loss, Loss of biomass, Desertification, Bush fires, Water-borne diseases among fauna	Increase forest biomass production and promote new fuel wood technologies; Enforce more sustainable land management practices; Adopt best forestry and agroforestry practices (selective felling for firewood, natural assisted regeneration, controlled land clearance etc.); Introduce community and participative management of forestry and fauna resources; Increase sustainable exploitation of non-timber forest products (NTFP); Introduce best practices in the field of fisheries and aquaculture; Increase and protect biodiversity (forests, wildlife etc.) from climate change-related risks; Set up a

				R&D facility devoted to climate change adaptations; Monitor climate change impacts on ecosystems on a permanent basis; Disseminate anti-erosion techniques; Rehabilitate and preserve wetlands
Burkina Faso	Energy	Floods; Hurricanes	Safety of hydroelectric power stations and transmission lines is compromised	Ensure that engineers and technicians involved in the design, monitoring and use of structures are better able to deal with climate change problems and related impacts; Improve energy transmission lines; Appoint a committee to bring codes and standards more into line with climate change requirements; Establish rapid intervention teams with sufficient resources to deal with emergencies as quickly as possible
Burkina Faso	Energy	Increasing Temperatures; Shifting Precipitation Patterns	Reduced hydroelectric production and thermal power production	Establish a climate monitoring/early warning system; Diversify electricity supply sources by developing other renewables (solar, biomass and wind); Build hydraulic capacities in the Sudanian zone, which is likely to see a slight increase in rainfall according to climate predictions; Provide increased flood protection for dams on the basis of strict compliance with construction standards; Store energy in hydraulic form through turbine water conservation and reuse; Make improvements to hydroelectric structures where necessary; Produce water management and development plans.
Burkina Faso	Energy	Increasing Evapotranspiration	Loss of biomass (timber), Security of electricity supply is compromised	Promote improved cooking stoves with a view to significantly reducing wood and charcoal consumption and improving household cooking conditions; Promote alternative energies such as butane and biogas; Promote the use of agricultural residue biomass in the form of briquettes
Burkina Faso	Healthcare	Droughts	Higher incidence of cerebro-spinal meningitis epidemics	Vaccination before first cases are reported; Organise reactive campaigns which target the entire population in epidemic zones; Increase meningitis monitoring using the geographical information system; Step up public awareness-raising and information campaigns
Burkina Faso	Healthcare	Floods	Higher incidence of diarrheal diseases, Outbreaks of water-borne diseases such as cholera, dysentery and salmonella, Increased malnutrition	Step up measures to prevent transmissible diseases; Incorporate climate-change-related impacts into the design and implementation of sanitary infrastructures; Incorporate climate change issues into research topics in the healthcare sector; Incorporate the management of climate change impacts into the state healthcare budget
Burkina Faso	Healthcare	Increasing Temperatures	Higher incidence of vector-borne diseases, such as malaria	Provide proper treatment in all cases of simple malaria using ACT; Provide intermittent preventive treatment of malaria using ITP for pregnant women and children and distribute long-lasting insecticidal nets (LLIN) in routine mass campaigns; Decontaminate

				swampy sites and waste-water and excreta; Combat malaria vectors (indoor spraying, behaviour change communication (BCC) at mass media and community relay level, treat breeding grounds)
Burkina Faso	Infrastructure	Heavy rainfall; Floods; Hurricanes	Faster deterioration of roads and buildings (especially made by adobe), Damages to public facilities	Improve access to adequate housing for disadvantaged populations by means of rental properties, self-build funding and new social housing; Construct public facilities and infrastructures (road, hydraulic and stormwater/wastewater drainage) which are fit for purpose and resilient thanks to high-quality design and implementation and proper maintenance; Update highway infrastructure construction standards
Burkina Faso	Water resources	Increasing Evapotranspiration; Shifting Precipitation Patterns	Surface water will evaporate faster and permanent water courses will tend to disappear, Reduction in infiltration to replenish the water table, negative impacts for agriculture, livestock farming, ecosystems, energy, health and infrastructure	Improve the mobilisation and protection of water resources; Improve water resource protection and conservation by developing water planning and management master plans; Improve access to sanitation; Improve knowledge about surface and, more importantly, underground water resources in the context of climate change; Monitor water retention (dam dikes, water flow, valve functioning etc); Provide water storage: construct modern wells, high-flow boreholes, dams; develop ponds; divert water courses); Combat silting of water bodies; Develop integrated water resources management (IWRM); Use appropriate technologies to reduce poor access for women to drinking water in the dry season
Cambodia	Agriculture	Increasing Temperatures; Shifting Precipitation Patterns; Droughts; Floods	Decline in rice yields; Disruption to coffee and rubber production; Negative impacts on fisheries	Increase capacity to address climate-induced opportunities in agricultural production systems, ecosystems, and protected areas; Agricultural diversification (e.g. crops, livestock etc.); Increase in productivity (e.g. crops, fisheries, livestock, forestry etc.); Opportunity for new cropping; Watershed and ecosystem management.
Cambodia	Water resources	Floods	Water-borne diseases	"Rehabilitate and build water infrastructures including small, medium, and large-scale irrigation schemes; Expansion of capacity for provision of water and sanitation, particularly to rural areas; Introduce technologies in waterworks development and rehabilitation in response to the negative impacts of climate change"
Cambodia	Energy	-	-	Facilitate for response by businesses and industries to carbon market opportunities for green trade and investment; Promote renewable energy and energy efficiency to reduce GHG emissions and impacts on health; Develop decentralized energy production systems integrating the application of renewable energy, especially solar energy

Cambodia	Health	-	Water- and vector-borne diseases	Improve healthcare infrastructure and capacity of health personnel to cope with vector-borne and water-borne diseases in the context of climate change
Cambodia	Infrastructure	Floods	Damage to roads and disruption of people's movement and transportation of goods	"Promote capital-intensive urban transport infrastructure planning and development; Provide climate proofing to rural infrastructure (roads, irrigation, wells and culverts) to be resilient to flood and drought; Promote early warning systems on hydro-met; Provide for and expand climate proofed rural road infrastructures and for connection between production areas and the market; Integrate climate change in the Environmental Impact Assessment process."
Cambodia	Coastal zones and biodiversity	Sea level rise; Tropical cyclones	Increase rate of coastal erosion; Negative impacts to tourism potential; Damages to coastal settlements	Improve forest ecology, flooded forest ecosystem, coastal zones; Enhance biodiversity conservation and restore ecosystems threatened by climate change; Promote and encourage community-based, ecosystem-based approaches and ecotourism as cost-effective ways of addressing climate change; Promote payment for ecosystem service schemes including Reducing Emission from Deforestation and Forest Degradation (REDD+);
Central African Republic	Agriculture and Food Security	Droughts; Shifting precipitation patterns; Increasing temperatures	Decline in the production of sorghum, maize, millet and peanuts; Land degradation; Loss of livestock; Lower income; Rural exodus; Famine and change in eating habit; Seasonal migrations of agricultural workers	Improve farm performance (agricultural loans) by integrating livestock farming into agriculture; Rehabilitate and make operational centres for the multiplication of seeds; Introduce seeds of short-cycle varieties adapted to the conditions of current climate; Set up a national system for popularizing forecasts and alert community-wide seasonal data to reduce vulnerability linked to false start of the growing seasons; Solve the outlet problem by creating the possibility of exporting agricultural products (food and other) to neighbouring countries; Establish a sustainable corridor management mechanism for transhumance; Establish a conflict prevention mechanism between farmers and breeders; Rehabilitate veterinary pharmacies
Central African Republic	Water Resources and Sanitation	Droughts; Floods	Increased evapotranspiration; Surface water loss; Reduction of water supply; Pollution of water resources; Water-borne diseases	Develop water resource monitoring system for underground and surface water; Strengthen capacities of government structures to improve delivery of water services and sanitation; Manage surface water collection in the Sudano-Sahelian and Sudanian zones; Establish water quality monitoring systems; Improve access to drinking water for rural populations and cities by creating water towers in larger cities and manual pump boreholes in villages; Implement social communication strategy to change norms and behaviours; Support sustainability of WASH interventions

Central African Republic	Health	Increasing temperatures; Droughts; Shifting precipitation patterns	Displacement of pathogenic areas; Strengthening of vectors; Resurgence of epidemics; Appearance of new pathogens; Loss of lives	-
Central African Republic	Energy	Increasing temperatures; Droughts	Greater incidence of wildfires; Lower wood production; Loss of lives; Damages to infrastructure; Lower hydroelectricity production	Promotion of improved stoves; Implement fire protection measures; Increase public awareness on fires and risk of electrocution
Central African Republic	Forests and Ecosystems	Increasing temperatures; Droughts; Shifting precipitation patterns	Higher incidence of forest fires; Decline in forest coverage; Land degradation; Negative impacts on distribution of species and habitats	-
Central African Republic	Infrastructure and Housing	Heavy rains; Floods; Droughts	Increase in runoff water; Damage to roads; Poor access to basic services; Collapses of residential houses; House fires; Loss of lives	-
Central African Republic	Education	-	-	Provide laboratories and research institutions with adequate equipment; Strengthen capacities of teachers and researches in the field of climate change; Integrate climate change knowledge into primary and secondary education curricula
Chad	Agriculture and livestock	Increasing temperatures; Droughts; Shifting precipitation patterns	Loss of agricultural and livestock potential and associated income; Malnutrition; Loss of natural habitats; Erosion; Deforestation; Extension of crop pests and diseases	Delimitation and planning of pastoral areas; Forage crop development; Regulation of pastoral mobility; Management and creation of pastoral water points; Diversification of water and soil conservation techniques; Improvement of the adapted animal breed; Water management for irrigated crops; Development of a commodity chain approach in the agropastoral and organic agriculture sectors; Agroforestry development; Promotion of improved crop varieties
Chad	Environment and forestry	Increasing temperatures; Droughts	Increased dieback of woody plants; Reduction of large trees; Disappearance of certain animal and plant	Bush and forest fire management; Promotion of deferred grazing; Protection and conservation of biodiversity and protected areas; Establishment and/or effective management of community forests;

			species; Degradation of ecosystems; Deforestation; Increased risk of invasive species; Increase incidence of bush fires	Showcasing of aboriginal skills and knowledge; Promotion and development of non-timber forest products
Chad	Water and sanitation	Shifting precipitation patterns; Increasing temperatures; Droughts; Floods	Drastic reduction of water levels, particularly of Lake Chad; Population and livestock displacement; Conflict-related displacement; Increase risk of epidemics	Rainwater collection and treatment systems; Promotion of basic sanitation measures (e.g. community-led total sanitation project and ecological sanitation); Improvement of knowledge on surface and groundwater resources; Management of ponds and adaptive dams; Construction of modern wells and boreholes
Chad	Human health and Nutrition	Heat waves; Floods; Droughts	Increased morbidity and mortality from vector- and water-borne diseases; Loss of lives; Increased number of meningitis cases; Malnutrition; Heat-related mortality	-
Chad	Renewable Energy	-	-	Development of biogas; Promotion of wind energy; Popularization of butane gas; Promotion of solar energy; Popularization of improved stoves
Chad	Risk management, infrastructure and land-use planning	Increasing temperatures; Heat waves; Heavy rains; Floods	Damage to roads, storm stewers, drainage systems, health infrastructure and power generation	Development of climate insurance; Development of alerts and early warning systems; Promotion of instruments such as zoning, building codes and redevelopment; Implementation of risk-sensitive and participatory land-use planning; Management of new climate-related natural disasters based on risk zone maps; Implementation of risk management and climate disaster plans at the national and local levels; Community awareness on climate risk prevention and management
Chad	Aquaculture and Fishery Resources	Increasing temperatures; Droughts	Loss of fishery potential and associated income; Loss of spawning areas; Salinization of water resources; Loss of oxygen saturation which eliminates fish species	Promotion of spirulina aquaculture; Promotion of fish farming; Stocking of dams and retention basins; Use of appropriate fishing gear and equipment; Increased fish supply
Chad	Education and Communication	Increasing temperatures; Heat waves; Floods	Deaths of children and teachers; Damages to	Prioritization of books and training guides; Adaptation of school calendars to climate change; Integration of adaptation into the education curriculum and in higher education modules; Promotion

			school infrastructure; Low rates of enrolment	of environmental literacy for adult; Finalization and implementation of the NAP communication strategy; Promotion of environmental clubs in schools and universities
Ethiopia	Agriculture	Shifting precipitation patterns; Heat waves	Shortening of crop plant maturity period; Low productivity of soils and animals; Increase in crop failure	Selecting resistant and tolerant varieties through switching and/or diversification; Increase use of organic fertilizers and appropriate mechanization; Strengthen crop diseases and pests monitoring; Use of appropriate technologies for both crops and livestock; Enhance soil and water conservation methods
Ethiopia	Agriculture	Droughts; Floods; Storms	Expanding crop diseases; Reduced animal health and reproduction; Contracting of pastoral zones across the country	Promote preparedness related to risk reduction; Create insurance schemes for anticipated climate risks, including drought and flood leading to crop failure
Ethiopia	Water	Increasing Temperatures	Decrease in availability of potable water; Increase in damage and decline of aquatic habitat and life forms	Enhance access to improved water, sanitation and health systems; Promote efficient use of water; Develop water supply and sanitation maps; Use small-scale wind and solar pump to increase water availability
Ethiopia	Water	Increasing Evapotranspiration	Decline in water supply; Increase in water pollution	Improve systems for soil moisture retention in arid environments; Develop water infrastructure for vulnerable people; Improve water allocation and transfer governance; Implement diversified water harvesting technologies
Ethiopia	Health	Increasing Temperatures; Droughts; Heat waves; Storms	Increase of vector- and water-borne diseases; Severe malnutrition; Increase in flood incidence; Displacement	Increase disease surveillance to promote evidence-based policy decisions; Strengthen health systems; Emphasize climate sensitive disease prevention and management; Improve emergency medical service; Balance high population growth with economic growth; Manage indoor air pollution
Ethiopia	Transport	Increasing Temperatures; Floods	Increase in infrastructural design costs; Damage of roads, bridges, rail roads and airport landings	Emphasize protecting and improving the lifespan of transport infrastructure; Review transport design and safety standards; Adopt and implement an adaptation-oriented asset management; Use transport systems to facilitate movement of aid and support to climate change-affected communities
Ethiopia	Power	Increasing Temperatures; Droughts; Floods	Erosion and silting problem on hydropower dams; Upstream degradation of natural resources; Scarcity of water reduced generation of energy	Ensure power generation capacity withstands climate change impacts; Ensure diverse energy mix; Improve energy efficiency; Accelerate access to off-grid energy

Ethiopia	Industry	Increasing Temperatures; Shifting Precipitation Patterns	Natural resources degradation leads to raw materials limitations; Infrastructural damage; Increased incidence of fire; Increase environmental pollution	Enhance climate smart production systems and products through proper positioning of industrial parks; Improve waste management for e-wastes, liquid waste, solid wastes; Enhance efficient logistics to haul raw materials; Strengthen formal finance institutions at all administrative and management levels
Ethiopia	Forestry	Increasing Temperatures; Heat Waves; Frost	Expansion of tropical dry forests and disappearance of lower mountain wet forests; Increased biodiversity loss; Increased prevalence of forest fires; Desertification	Use agro-forestry and ecosystem services as an overall adaptation strategy; Implement diverse ecosystem conservation for mountains, watersheds, dry forests, tropical forests and rangelands; Implement agro-diversity conservation and management
Ethiopia	Forestry	Floods; Landslides; Storms	Increased loss of indigenous species; Expansion of toxic weeds; Increase in GHGs in the atmosphere; Increased in pests and diseases	Promote value added commercialization of timber and non-timber forest products along with payment for ecosystem services; Promote afforestation and reforestation practices; Implement forest health activities; Implement participatory forest management and community-based rehabilitation of degraded forests
Ethiopia	Urban	Droughts; Floods	Increase in hunger and famine; Intensifying migration of rural dwellers to towns; Damage on roads and buildings; Increased solid and liquid waste accumulation	Increase the provision of housing; Improve housing conditions; Enhance urban greenery; Improve urban infrastructure; Promote efficient household/urban waste management system
Ethiopia	DRR	Droughts; Floods; Storms; Heat Waves	The highest mortality due to drought was in 1983, when approximately 300,000 people died; Floods occur frequently and also affect thousands of people	Enhance planning for disaster and climate risk management; Reinforce early warning systems related to both quick and onset disasters; Install knowledge management systems, climate information exchange systems; Enhance networking capabilities
Kiribati	Water and food security	Increasing Temperatures; Sea Level Rise; Droughts; Storm Surges; Floods	Continued and increasing contamination of groundwater; Increased water-borne diseases; Severe shortages of fresh water; Dramatic	Conduct agricultural research programmes on sustainable and resilient food crop and livestock production systems; Develop incentives and strategies for engaging local communities in harvesting and protecting water sources for public water supply and form village water and sanitation committees; Strengthen the capability of communities to take practical and sustainable

			salinisation of fresh water sources; Decline in production of food crops; Reduced livestock productivity; Loss of traditional agriculture skills; Malnutrition	measures to address food and nutrition security; Strengthening community involvement in mangrove replanting and reporting on mangrove and its species health; Improve food preservation and storage techniques to avoid food shortages and increase food availability through use of both modern and traditional skills and knowledge
Kiribati	Health	Increasing Temperatures; Heavy Rainfall	Increase in water- and vector-borne diseases; Increasing risk of diarrhoeal diseases; Increase of enteric infections	Develop and provide communities with health information necessary to address health risks of climate change; Strengthen routine systems for surveillance of environmental hazards and climate-sensitive diseases; Provide further specialist training to nurses in disease surveillance and how to respond to an outbreak; Reduce incidence of noncommunicable diseases and mental health issues
Kiribati	Infrastructure	Sea Level Rise; Storm Surges; Coastal Erosion; Floods	Increasing loss of usable land; Increasing destabilisation of beaches; Loss of major transport facilities; Negative impacts on basic services (hospitals, schools, government housing); Increasing damage to roads, leading to isolation of communities	Retrofit school infrastructure where required to withstand extreme weather events; Retrofit coastal infrastructure (roads, causeways, jetties) to sustain it against threats of climate change and disaster risks; Construct runway seawall and runway end safety area to protect runway from sea level rise and erosion and to accommodate relief plane in times of disaster; Implement hard and soft coastal protection measures
Kiribati	Education	Sea Level Rise; Storm Surges; Coastal Erosion; Floods; Increasing Temperatures; Droughts	School infrastructure might have to be relocated or retrofitted; Increasing maintenance costs; Lower rates of enrolment; General feelings of helplessness	Update and provide accurate and contextualised materials and information on climate change and disaster risk for use in conjunction with Kiribati's national curriculums; Incorporate climate change, DRM and other related areas such as ICT, agriculture, livestock, environment, fisheries, water and health into primary, junior secondary and senior secondary school
Kiribati	DRR	Storm Surges; Seal Level Rise	A number of houses were washed away at Marakei in 2008 because of storm surges; In February 2019, infrastructure and properties were severely damaged by a storm surge	Construct a permanent National Disaster Risk Management Office with all appropriate equipment; Conduct capacity-building programmes to enhance staff performance in disaster risk management; Develop a strong disaster information system that can enhance information sharing between National Emergency Operation Centre and outer islands in Gilbert, Line and Phoenix Groups; Provide training for emergency personnel on mobilising people with disabilities (including gender considerations); Enhance understanding of loss and damage through data collection and vulnerability analysis

Liberia	Agriculture	Increasing temperatures; Heavy rains	Increased incidence of pests (grasshoppers) and diseases (coffee rust); Increased heat stress on crops; Reduced growing season and drying period because of overall increase in average rainfall; Accelerated erosion of topsoil	1. Strengthen the capacity of the Ministry of Agriculture, including training of experts, logistics, and use of technology for the management of the sector. 2. Improve the effectiveness of pest, disease, and weed management practices through the use of integrated pest and pathogen management development and varieties and species resistant to pests and diseases and improving quarantine capabilities and monitoring programs. 3. Assess crops vulnerability and suitability (cropping pattern) for different Agroecological zones. 4. Enhance climate-proof agro-infrastructural systems that strengthen the capacity of local farmers to increase productivity. 5. Support communities in livestock and crop sectors by inventorying and disseminating indigenous knowledge, establishing and/or strengthening insurance schemes, early warning, early action system, vaccination campaign, disease control, etc., to cope with the stress based on climate variability. 6. Develop and introduce a diverse range of integrated Soil fertility management (SFM), water harvesting, and conservation techniques to farmers as a sustainable means of improving soil fertility, intensifying agricultural production, and coping with extreme conditions (aridity, waterlogging, flood, etc.) 7. Strengthen the Central Agricultural Research Institute (CARI) capacity for research development of climate smart agriculture initiates in Liberia, including the setting up of seed banks and soil management, crop diversification, immigration, improved livestock breeds, etc. 8. Develop and implement agriculture technologies and methodologies, including hydrological technology models and scenarios for planning and ensure its promotion through agricultural programs by considering social-economic and gender differences. 9. Develop climate-resilient crops, promote drought – resistant, flood-tolerant, and establishing gene bank of climate-resilient varieties of indigenous food crops. 10. Develop and support coping strategies such as irrigation infrastructure, intercropping, aquaculture, climate-resilient plant varieties to support the farming system and encourage farmers to engage in them. 11. Promote the development of sustainable livestock programs for farmers, including grazing management systems. Livelihood diversification (bee harvesting, rabbit, guinea fowl, and indigenous poultry) and breeding animals to adapt to climate change. 12. Develop a communication strategy to increase farmers' awareness

				of climate change and strengthen the coordination of existing structures and institutions available to help them adapt to its impact
Liberia	Coastal Sector	Seal level rise; Increasing temperatures; Heavy rains	Coastal flooding leading to displacement or migration; Loss of life, crops and livestock; Beach erosion; Damage to infrastructure	1. Develop and implement coastal zone policy, design, and management plan. 2. Assess and build the capacity of agencies and managers responsible for managing coastal adaptive capacity in the sector. 3. Develop an integrated management plan for coastal zone management as well as an early warning system that includes training and capacity development for coastal management and monitoring 4. Promote and implement disaster risk management in general (especially disaster preparedness). 5. Support the rehabilitation and protection of wetlands and mangroves, including awareness and education of their host communities. 6. Develop and implement a program for climate-proofing new investments in infrastructure (roads, sewers, water supplies, and other infrastructure) in coastal settlements and rural areas to protect continuous access to livelihoods, health care, and education. 7. Design and implement a strategic communication action plan to inform and educate people about changes and challenges associated with coastal areas related to climate change and how they can adapt to cope with these changes and challenges. 8.Construct sea walls or revetment (NDC, 2015)
Liberia	Energy	Seal level rise; Increasing temperatures; Heavy rains	Damages to energy supply facilities; Insufficient water level for energy generation	1. Establish and promote a robust national program on solar energy (e.g., hybrid systems, installation of solar panels, promotion of solar street lighting, etc.) and other energy-efficient lighting technologies. 2. Support the provision of energy-efficient technologies such as energy-efficient bulbs to provide power and lighting for schools and other public institutions and households as a means of enhancing or introducing energy-efficient technologies. 3. Support the promotion and implementation of energy plantation schemes to minimize natural forest pressure and reduce energy stress. 4. Develop a system to regulate the sustainable use of biomass energy. 5. Promote and support the development and utilization of community-based off-grid/mini-grids. 6. Conservation and protection of water catchments, including around hydro-power and municipal water supply sources.

				7. Prevent sedimentation that could hinder the production of energy in hydroelectric facilities 8. Enhance implementation of an energy generation mix plan that increases the resilience of the current and future energy systems to the impacts of future climate variability and change. 9. Establish Protection of water catchment around hydropower sources (NDC, 2015).
Liberia	Fisheries	Increasing temperatures; Heavy rains	Disruption to reproductive patterns and migratory routes; Reduced aquatic biodiversity; Loss of income and livelihoods; Reduced protein intake and nutrition deficits for human populations	1. Strengthen the capacity of the Bureau of National Fisheries, including staffing and logistics for research monitoring and enforcement. 2. Invest in and support artisanal fishing communities, including training, fishing gear, and alternative livelihoods. 3. Set up robust monitoring, reporting, and verification system that captures and reports timely and accurate changes in the stock of productivity and pressure on fisheries; and implement adaptive management practices for managing the sector. 4. Support research to fully understand pressures on fisheries related to climate change impacts and identify appropriate measures, including diversification of livelihood portfolio of fishery-dependent communities. 5. Identify, map, and protect areas valuable for fisheries (e.g., deep pools in river systems that serve as spawning areas), including the setting up of marine protected areas. 6. Support the establishment of a system to reduce external stressors on fisheries by instituting changes in a vessel or gear types as well as instituting actions and regulatory measures to reduce land-based sources of pollution (e.g., agricultural, and urban runoff) and destructive fishing practices (e.g., fishing with explosives and poisons). 7. Integrate fisheries fully into climate change adaptation and food security policies at the national level (draft and enact where non-existent) to ensure incorporation into broader development planning. 8. Support the diversification of the livelihood portfolio of fishery-dependent communities. 9. Support the establishment of early warning systems to identify probable threats and risks related to fisheries. 10. Support the establishment of improved information and communication networks for decision making and planning and between fishing communities to support information sharing about potential shocks in the system. 11. Establish a monitoring system for fishery management and

				climate change 12. Establish a surveillance system to promote a smart fishery system (NAPA, 2008) 13. Promote sustainable fishing practices and policies Regulate fishing practices to prevent overexploitation and fishing in restricted areas. 14. Establishment of a department of research at the Bureau of Fisheries to understand climate vulnerability assessment fishes 15. Spatially develop marine protected areas 16. Establish and deployed Bureau of Fisheries surveillance team 17. Number of the early warning system and monitoring system established to a reduced external stressor on fisheries 18. Community trained on sustainable fisheries activities
Liberia	Forestry	Increasing temperatures; Heavy rains	Increase in the incidence of pests and diseases; A decline in forest cover; Increased erosion and runoff	1. Strengthen the capacity of the FDA, including training of experts and logistics for forest management 2. Implement sustainable and, where applicable alternative livelihood initiatives for forest-dependent communities; to enable them to become less reliant on forest resources; 3. Promote community forest activities beyond timber extraction as a management tool for sustainable forest using indigenous species and knowledge. 4. Establish a comprehensive monitoring system for forest resources by building on existing systems (including non-timber forest products) to detect changes in the conditions of the ecosystem services provided by forests. 5. Implement reforestation and afforestation activities in degraded areas, increase rural income, and improve biodiversity richness, including wild fauna. 6. Identify and map for proper management of water catchment areas in forests that are valuable to communities. 7. Promote the consolidation of protected area network by considering landscape approach, ensuring that it consists of a large spectrum of forest types across various environmental gradients and enhance connectivity between habitats. 8. Establish and/or strengthen coordination mechanisms with other line ministries and agencies that might implement activities that affect forest and wildlife and ensure that the principle of sustainable forest and wildlife management is mainstreamed in national and sectoral policies and programs. 9. Enforce regulations related to illegal hunting to eliminate poaching and implement an environmental ‘Code of/ethics in the wildlife sector. 10. Develop and implement a communication strategy to increase

				the awareness of relevant stakeholders, particularly forest-dependent communities, about the impact of climate change and how they can adapt to these changes.
Liberia	Waste Management	Sea level rise; Increasing temperatures; Heavy rains	Damages to waste management facilities and landfills; Inadequate water supply to manage sewage systems; Increase in waste-borne diseases	1. Strengthen capacity at the community and institutional level for integrated waste management. 2. Develop an integrated waste management strategy and system for all types of waste, assigning priority to prevent waste generation with nationally appropriate low greenhouse gas emission technologies that are well managed and compatible with methane capture and use for electricity generation. 3. Promote private-public partnership (PPP) and other ventures that attract financing for infrastructure investments in the waste sector. 4. Design and implement a system to run urban waste into input for agricultural production through composting waste for use in food security programs in the urban (urban agriculture) and rural areas. 5. Develop landfills for all major cities and use the Clean Development Mechanism (CDM) and Nationally Appropriate Mitigation Actions (NAMAs)to develop methane recovery and power generation projects in landfills.
Liberia	Water resources	Increasing temperatures; Heavy rains	Deterioration of drinking water quality; Insufficient water levels for agriculture, fishing and energy sectors; Crop yields decreases	1. Fast-track the implementation on the mainstreaming of climate change into water resources management. 2. Establish a surveillance team on water resources vulnerability.
Liberia	Health	Increasing temperatures; Heavy rains	Increased incidence of vector-borne diseases; Emerging and re-emerging water and foodborne diseases; Exacerbation of respiratory diseases	-
Liberia	Biodiversity	-	-	Conduct a scoping study to identify and prioritize areas for EbA measures and to recommend specific approaches, institutional arrangements, and financing option; Conduct (nationwide/regional) assessments on potential climate change impacts on biodiversity and ecosystems; Fast track the integration of Ecosystem-based Adaptation (EbA) approaches into Liberia's overall adaptation response to climate change
Nepal	Agriculture and food security	Increasing temperatures; Shifting precipitation patterns; Hailstorms	Reduced crop yields; Loss of production and nutrients due to moisture loss;	

			Increased incidence of pests and diseases	
Nepal	Agriculture and food security	Increasing temperatures; Shifting precipitation patterns	Increased incidence of diseases and pests; Depleted grass and feed; Heat stress; Appetite loss; Reduced milk production	Explore, assess, and introduce climate-resilient land species crossed with local breeds; Diversify rural livelihoods and increase incomes through commercial and integrated livestock programmes; Promote circular economy practices for resilient rural livelihoods; Strengthen the National Gene Bank to conserve local land species;
Nepal	Agriculture and food security	Floods; Landslides; Hailstorms; Windstorms	Negative impacts for farming communities in the mountains	Build the capacity of local peasants and local government to cope with climate risks; Create an enabling environment that promotes private sector engagement in the provision of insurance products in the agricultural sector that help farmers and communities cope with climate risks; Establish and operationalize early warning systems and localized weather stations for precise climate services; Provide a package of climate services (such as weather information, soil moisture conditions, and incidence of extreme events) directly to the farming communities; Provide timely and accurate information regarding agriculture inputs and output prices.
Nepal	Agriculture and food security	Droughts; Floods; Landslides	Loss of already limited arable land; Loss of soil fertility; Outbreaks of new pests and diseases	Increase productivity by improving soil fertility through adaptive agriculture interventions. Improve the soil nutrients that support the growth of all forests and agricultural plants including carbon sinks and stress tolerant varieties.
Nepal	Forests, Biodiversity, and Watershed Conservation	Droughts; Dry spells; Heat waves; Increasing temperatures	Higher incidence of forest fires; Changes in regeneration pattern of forests and non-timber forest products; Risk of forest species extinction	Prevent and manage forest fires through enabling policy implementation; Capacitate forest-based institutions through technology development and transfer; Build the resilience of forest ecosystems, biodiversity and rural livelihoods
Nepal	Forests, Biodiversity, and Watershed Conservation	Droughts; Dry spells; Heat waves; Increasing temperatures	Decline in forest distribution will negatively impact watersheds, limiting access to food, forest products, household energy and medical plants	Build resilience to climate vulnerabilities and risks to the Karnali watershed community and people; Secure river - and forest - based watershed resources; Enhance adaptive capacity of indigenous people and local communities and engage them in participatory watershed conservation; Promote upstream-downstream linkages to reduce downstream climate risk; Promote watershed management for conservation of soil fertility and enhanced productivity; Support local livelihoods through watershed management; Maintain water availability both above and under the ground; Enhance climate resilient forest growth; Explore, assess, and promote green jobs that support maintaining a healthy ecosystem; Enhance livelihoods of forest dependent communities through diversifying income sources and promoting the circular economy in the forest sector.

Nepal	Forests, Biodiversity, and Watershed Conservation	Droughts; Floods	Loss of biodiversity	Safeguard wild fauna from climate extreme events; Establish climate resilient safe wildlife passage in selected corridors and connectivity between protected areas; Manage and restore ecological connectivity; Strengthen landscape/arc level connectivity and increase buffer zones to build capacity to respond to climate-induced disasters; Explore, assess, and implement physical and biological means of disaster management in Protected Areas.
Nepal	Forests, Biodiversity, and Watershed Conservation	Droughts; Dry spells; Heat waves; Increasing temperatures; Floods	Degradation of ecosystems health due to increasing incidence of forest fires, invasion of alien species and diseases	Maintain healthy wetlands and conserve biodiversity by building small earthen dams, connecting water bodies, and restoring forests; Sustain ground recharge in the Bhawar and dune areas through retaining streams, gorges, estuaries, waterholes, ponds, and lakes; Control invasive species of forest, wetland, and rangelands; Promote and restore Rare, Endangered, Endemic, and Threatened (REET) species.
Nepal	Water resources and energy	Increasing temperatures; Glacial retreat	Water shortages; Changes in hydrology	Build the resilience of vulnerable communities in rural and urban sectors; Develop climate smart designs and guidelines for water resources infrastructure; Formulate meteorological acts, regulations and other policy protocols to address climate risks; Capacitate the National Meteorological and Hydrological Services to provide downscaled weather, climate and hydrological prediction and services; Develop a national framework for climate information services to enhance access to climate information; Promote multiple water use systems; Establish water recharge, retention, and re-use technologies through the spring-shed mappings; Build dams for rainwater harvesting, gully erosion control, and protection of river valley settlements and assets; Enhance climate resilience capacity of vulnerable rural people in water scarce areas; Promote solar water pumps to improve access to drinking water and irrigation water.
Nepal	Water resources and energy	Increasing temperatures; GLOFs	Damage to electricity production plants and their transmission lines; Damage to infrastructure and loss of lives	Assess climate risk of the hydro projects through mapping of climate hazards; Undertake policy reform for climate proof hydroelectricity management; Equip and enable rural institutions to meet basic needs (health and education) during extreme weather events; Promote non-conventional energy (biogas, solar, wind, and hydropower) and fuel-efficient technologies to reduce firewood demand; Prevent and control, and minimize damage to infrastructure due to climate-change induced GLOFs; Establish infrastructure for glacier lake water lowering; Establish and operate EWS with cooperation with emergency responses; Build capacity of the federal, provincial, and local level public emergency operation centers; Quantify fresh water storage and the impact of

				climate change on glaciers and snow coverage; Reduce the risk of GLOFs.
Nepal	Water resources and energy	Increasing temperatures; Glacial retreat; GLOFs	Lower water availability has negative impacts on energy production; GLOFs damage energy infrastructure including dams and hydropower plants	Promote renewable energy and energy efficiency; Identify, assess, and develop diverse energy sources for energy resilience; Increase energy mix in the national energy system; Identify, assess, and develop an inventory of climate-resilient energy efficient technology; Build resilience of energy systems and infrastructure.
Nepal	Rural and Urban settlements	Heavy rains; Floods; Heat waves	Higher incidence of landslides in the mountains; Loss of lives; Destruction of buildings, transport systems and communication systems; Damage to cultural heritage; Lack of access to health and education services	Relocate climate and disaster vulnerable populations in safer and serviced areas. Identify safer locations for resettlement and relocation. Introduce integrated settlement planning concepts for disaster resilient community development.
Nepal	Rural and Urban settlements	Increasing temperatures; Droughts; Heat waves	Acute disturbance in lives and livelihoods of rural and urban populations due to shortage of water supply	Prepare climate risk informed urban and rural development plans. Promote climate resilient building practices. Design and plot climate and disaster resilient construction technology. Explore and identify environmentally friendly building materials and construction technologies. Disseminate information about and raise awareness of climate resilient building practices.
Nepal	Industry, Transport, and Physical Infrastructure	Heavy rains; GLOFs; Landslides	Damages to transport systems; Collapse of industrial buildings and properties; Increase instability of land; Damage to road drainage structures; Scour bridge foundations	Maintain and relocate industry, transport, physical infrastructure to address climate vulnerabilities following the standards and assessment reports; Strengthen, promote, construct climate smart infrastructure and industries; Develop guidelines on building climate resilient infrastructure systems; Develop a pool of climate resilient technologies that help build robust infrastructures
Nepal	Industry, Transport, and Physical Infrastructure	Droughts	Reduced availability of water for industrial purposes	Promote diverse energy sources for energy security and resilience. Develop and implement energy mix approach in special economic zones and industrial districts.
Nepal	Tourism, Natural and Cultural Heritage	Glacial retreat; Heavy rains; GLOFs; Landslides; Floods; Blizzards; Windstorms	Loss of biodiversity; Reduced landscape aesthetics; Damage to tourism infrastructure	Diversify and promote tourism destinations and products for sustainable tourism; Promote agro and eco-tourism value chains that consider the polluter pay principles and climate resilient practices; Facilitate private and foreign direct investments to improve the climate resilience of the tourism infrastructure;

				Promote climate smart and environmentally friendly tourism destinations.
Nepal	Tourism, Natural and Cultural Heritage	Glacial retreat; GLOFs; Floods; Landslides; Blizzards; Windstorms	Damage and destruction of infrastructure, such as physical property and roads; Risk to health and safety of trekkers and mountaineers	Develop and install hi-tech digital forecast information systems; Provide accurate, timely, and geo-specific meteorological information; Develop disaster preparedness plans for the high altitude area destinations by 2030; Develop emergency rescue centers at appropriate locations; Promote insurance in the tourism sector covering climate risks.
Nepal	Tourism, Natural and Cultural Heritage	GLOFs; Heavy rains; Floods; Landslides	Damaged or destroyed cultural heritage sites	Develop technology for retrofitting and rebuilding the cultural heritage; Build national capacity on ensuring compliance with a regulatory framework; Identify, conserve, and restore cultural, historical, and archaeological sites that are at risk of damage due to climate change; Promote archeo-and heritage tourism; Develop climate resilient infrastructure at site specific tourist destinations; Preserve indigenous and traditional knowledge
Nepal	Tourism, Natural and Cultural Heritage	Glacial retreat; Blizzards; GLOFs; Heavy rains; Floods; Landslides	Loss of traditional knowledge, practices and languages due to migration and shifting of locations; Damage to tourism infrastructure; Loss of national GDP by decreased tourism activity	Upgrade existing and build 500 new climate resilient homestays. Increase gender equality and social inclusion (GESI) inclusive tourism employment at the local level and develop women leadership in the sector. Capacitate homestays to serve climate, gender and indigenous knowledge-based tourism products; Promote local tourism for livelihoods promotion; Make the tourism destinations climate resilient.
Nepal	Health, Drinking Water and Sanitation	Increasing temperatures; Floods; Landslides; Droughts	Contamination of water sources; Poorer sanitation conditions; Water- and vector-borne diseases; Damage to infrastructure; Inaccessibility of health care services	Empower and inform health care providers to respond to climate risk and vulnerabilities. Ensure sustainable and safe management of water, sanitation, and health care waste services. Ensure use of sustainable energy (renewable) in health care facilities and services. Develop climate resilient infrastructure to enable efficient functioning of health care facilities during extreme weather events.
Nepal	Health, Drinking Water and Sanitation	Increasing temperatures; Shifting precipitation patterns; Floods	Water-borne diseases; Vector-borne diseases; Respiratory diseases; Food-borne diseases; Increase incidence of diarrhea and malaria; Mental illness	Operationalize a disease surveillance system. Integrate climate change and health issues in the academic curriculum. Strengthen and equip public health laboratories to better assess climate sensitive diseases. Enhance capacity of health services and responders to act swiftly in the case of climate emergencies. Strengthen the rapid and emergency response system.
Nepal	Health, Drinking Water and Sanitation	Increasing temperatures; Floods; Landslides; Droughts	Pollution of water wells; Inaccessibility of water sources; Damage and disrupt of water and	Improve health and equality of life of all urban and rural dwellers. Ensure adequate open spaces and parks for healthy behaviours. Improve environmental health services (water supply, sanitation, solid waste management, food safety and air pollution monitoring

			sanitation infrastructure; Damage of health care facilities and services	and control). Increase urban forests coverage and conserve ecosystems that are stable and sustainable.
Nepal	Health, Drinking Water and Sanitation	Increasing temperatures; Glacial retreat; Shifting precipitation patterns	Changes in the seasonality of river flows; Reduction of water availability	Support local governments in the conservation of water resources (surface and ground); Promote and support watershed management for sustainable water supply service delivery; Promote and support water recharge activities; Develop early warning systems for water source (surface and ground) yield, demand, and quality.
Nepal	Disaster Risk Reduction and Management	Increasing temperatures; Floods; Landslides; GLOFs	Damage to WASH systems amounted to USD196 million over 6-year period; Damage to water and sanitation infrastructure and services	Policy reform and/or formulation to make climate-sensitive WASH, Health plans programmes; Support local government on integration and implementation of climate change adaptation in local level WASH and health plans and programmes; Develop national guidelines to help local governments to integrate multiple use of water, water quality improvement system, insurance and hybrid technologies; Operationalize National Health and Wash Management Information System Integrating with hydro-meteorological, land-use data for climate sensitive planning, implementation and monitoring; Capacitate stakeholders on climate resilient WASH interventions; Explore technologies to implement climate resilient water supply systems and sanitation services; Design and implement climate proofing WASH services; Promote adaptive water, sanitation, and hygiene practices
Nepal	Disaster Risk Reduction and Management	Increasing temperatures; Floods; Landslides; GLOFs	Loss of lives; Destruction to infrastructure, property and assets; Loss of livelihoods; Food insecurity; Loss of education	Establish timely, effective, people-centred GESI sensitive early warning systems that reach hazard affected communities of Nepal; Develop and operationalize adaptive social protection/shock responsive social protection frameworks and mechanisms. Provide adaptive social protection through insurance companies.
Nepal	Disaster Risk Reduction and Management	Increasing temperatures; Droughts	Increased incidence of forest fires; Destruction of infrastructure; Loss of lives	Map climate disasters in forest areas. Implement DRRM schemes phase wise to control disasters. Build resilience of forest sector to climate induced disasters. Reduce and control the magnitude and frequency of domestic fires. Build capacity of relevant authorities and stakeholders on the use of domestic fire control tools and techniques.
Sierra Leone	Agriculture and food security	Increasing temperatures; Shifting precipitation patterns; Droughts	Decrease in agricultural production; Food shortages; Famine and malnutrition; Price increase	Adoption and application of climate smart and conservation agriculture through best agricultural practices that enhance soil fertility and improve crop yield; Integrated management of crops and livestock management; Develop and maintain seed banks to provide a variety of seed types that preserve biological diversity and enable farmers to make informed choices; Promote innovative and adaptive approaches such as irrigation and water harvesting to

				protect farmers from variability in rainfall; Provide appropriate infrastructure, social services and mechanization of agriculture in the rural areas to slowdown massive movements of youths into urban areas; Mainstream climate change into agricultural development strategies; Support the establishment of adequate weather stations around the country to provide reliable and adequate weather data to farmers; Provide adequate support to the Sierra Leone Agricultural Research Institute as well as Njala University to develop appropriate crop varieties and production practices that will enhance resilience to adverse weather conditions; Develop modelling approaches and tools to allow assessment of impacts of climate change on export and domestic crops and meat production; Develop regional links to fund and promote plant breeding programmes for common crops; Review approaches to integrated pest management under climate change; Conduct a feasibility study to gather information on community perceptions of climate smart agriculture techniques
Sierra Leone	Water resources and energy	Shifting precipitation patterns; Droughts	Lower water availability; Reduced stream flow of rivers; Reduced surface water negatively impacts rural population; Decrease in water quality	Improve planning and coordination of the use of the river basin, which may provide solutions to problems of water quality and supply; Increase and maintain investment in hydrological monitoring and water use through a national database; Fund research on adopting a water resources and water supply planning method under climate change; Develop appropriate modelling tools to assist strategic planning of water resources; Investigate shifting focus from ground water to surface water storage for water supply to reduce the reliance on vulnerable coastal aquifers.
Sierra Leone	Water resources and energy	Shifting precipitation patterns; Droughts	Decrease in hydropower production	Establish and operationalize a National Centre for Renewable Energy and Energy Efficiency (NaCREEE) to promote off-grid stand-alone solar (SAS) investments through technical advice and knowledge sharing in the areas of policy and regulation, technology development and transfer and public education; Increase awareness of off-grid SAS and strengthen market knowledge by improving market intelligence; Strengthen local institutions and empower the private sector through capacity, network and partnership building; Provide up to date market information through research and awareness raising campaigns; Align technology development and knowledge transfer goals with regional goals set for 2030; Technically support the Energy Planning Unit in creating a pipeline of off-grid SAS projects; Introduce solar technology management in school curricula and technical and vocational education at the tertiary level; Develop guidelines for the standardization of off-grid solar systems including technical equipment, design and assessment

				methods, operations and maintenance procedures and environmental compliance; Mobilize financial institutions to create investment packages and counterpart funding; Expand women's and youth employment opportunities and participation in the management of off-grid solar energy interventions; Build women-led partnerships at the local level to facilitate knowledge exchange, resource mobilization and sustained quality of services; Bridge the gap in the proportion of women to men employment as solar technicians, engineers and project managers by promoting the entry of more women into jobs delivered within the sector through information, communication, education campaigns, scholarships and job placements; Build the capacities of youth, women, PWDs, and other disadvantaged groups in using off-grid solar energy resources safely and productively (including for livelihood and business development or improvement).
Sierra Leone	Infrastructure (including WASH, transportation, and urban development)	Sea level rise; Floods; Coastal erosion; Storms; Increasing temperatures; Heat waves	Ports and tourists facilities are threatened by SLR; Damages to roads; Wastewater collection and treatment facilities are often inundated; Increased episodes of diarrhoeal diseases and seafood poisoning; Higher malnutrition and child mortality rates; Increased malaria episodes; Loss of lives; Increase water-borne diseases	Enhance waste management systems at all levels to reduce pollution and greenhouse gas emissions to improve health of both humans and animals and reduce climate change; Support the construction of appropriate roads particularly feeder roads in rural areas as a climate resilience strategy; Diversify economic growth through a strengthened transport sector, particularly infrastructure to contribute to the reduction of greenhouse gas emissions; Strengthen integration of climate change adaptation into the health sector; Monitor and control WASH activities in informal settlements
Sierra Leone	Coastal zone management (including fisheries, marine resources, and coastal ecosystems)	Shifting precipitation patterns; Increasing temperatures; Droughts	Decreasing river flows; Saltwater intrusion; Loss of fish and aquatic plant species; Reduction in coastal sediments	Promotion of non-destructive fishing techniques to maintain resilience of marine ecosystems; Promotion of monitoring, control and surveillance of fishing grounds and fish stocks for sustainable exploitation; Promotion of climate change related education and awareness programmes; Improve productivity and sustainable management of fisheries and the marine sector; Develop and operationalize an integrated coastal zone management plan; Adopt an adaptive management approach for the governance of coastal management institutions and interventions; Improve fisheries governance through awareness raising and law enforcement to regulate fishing practices; Mainstream climate change adaptation into coastal development plans, using local development funds managed by councils to build resilience.

Sierra Leone	Coastal zone management (including fisheries, marine resources, and coastal ecosystems)	Sea level rise; Floods; Shifting precipitation patterns	Loss of coastal ecosystems; Saltwater intrusion; Decrease in quality and quantity of groundwater resources; Negative impacts to livelihoods	"Delineate hazard (flood and erosion prone) areas along the coastline; Improve the quality of topographic data for the coastal zone; Establish robust and long-term mangrove ecosystem health surveillance, monitoring and analysis to develop insights into their current state and map future risks and vulnerabilities; Strengthen the adaptive capacity of the most vulnerable groups and communities through social safety nets and insurance schemes; Undertake research to assess local uptake potential of livelihood techniques and technologies; Promote agri-sylvicultural practices and sustainable rice cultivation in coastal landscapes; Operationalize a Coastal Chiefdoms Natural Resources Management Network (CCNRMN) and various co-management committees; Support the development, validation and enforcement of by-laws on mangrove wood harvesting, fishing and sand mining, at local and regional levels to promote mangrove conservation and adaptation to climate change; Collect physical and socioeconomic data to better understand vulnerabilities and impacts; Train relevant coastal institutions on climate change adaptation and mangrove conservation. "
Sierra Leone	Environment (including forestry, mining, tourism and land management)	Storms; Floods; Windstorms; Coastal erosion	Deforestation; Loss of biodiversity; Invasive species; Shift in vegetation from tropical rain forest to tropical dry forest; Increase episodes of landslides	"Manage rangelands and pastures by managing grazing systems and grazing intensity, fire management and pasture rehabilitation; Restore degraded lands with high production potential; Establish new forest reserves, national parks and protected areas; Mainstream climate change adaptation into land reforms, including establishment of a land commission and revision of the land policy"
Sierra Leone	Environment (including forestry, mining, tourism and land management)	Seal level rise	Damages to tourism infrastructures	Enhance the resilience of the tourism value chain.
Sierra Leone	Disaster management	Droughts; Floods; Storms	Loss of lives; Damages to roads; Damages to agricultural fields; Water pollution; Transboundary impacts via three rivers (Great Scarcies; Little Scarcies and Mano)	Promotion and facilitation of early warning and disaster preparedness system; Transformation of the National Meteorological Services of Sierra Leone; Build capacity in observations and monitoring of climate systems, and in developing, packaging and communicating weather and climate information; Develop deeper insight into climate related hazards, vulnerability and risks; Promote climate related research, modelling and prediction of weather and climate events; Adopt the current disaster risk reduction policy into a comprehensive Disaster Management and Emergency Response Policy; Establish the enabling legislative framework to implement the DMD policy and action plan;

				Establish and/or strengthen the high-level National DMD Council (NDMC), in the Office of the Vice President; Establish a national disaster management agency as the primary national government agency for disaster management response.
South Sudan	Agriculture, Livestock and Fisheries	Shifting precipitation patterns	Delayed planting and earlier harvesting; Shortened growing season; Reduced yields and crop failure	Introduce and expand irrigated agriculture for crop and livestock production; Improve agricultural infrastructure and facilities to support climate-smart multi-cropping systems; Establish and improve facilities to reduce post-harvest waste and to enhance value-added food processing (e.g., pasta, biscuits and bread) in market centres; Improve storage and conservation of seeds and introduce early maturing varieties;
South Sudan	Agriculture, Livestock and Fisheries	Shifting precipitation patterns; Increasing evapotranspiration; Increasing temperatures; Droughts	Lower yields for maize, sorghum and wheat; Reduction in soil moisture; Unfeasibility of rain-fed agriculture; Increased soil degradation	Enhance resilience to rainfall variability through rangeland rehabilitation; Encourage soil erosion control measures, including early adoption in areas susceptible to increased rainfall under climate change scenarios; Promote water technologies for water savings, recycling, harvesting, irrigation and sustainable management for agricultural purposes; Improve community and farm-level water resources management and incorporate projected moisture availability and variability into local-level water management and planning
South Sudan	Agriculture, Livestock and Fisheries	Increasing temperatures; Shifting precipitation patterns; Droughts; Floods	Increased potential for pest and diseases outbreaks among crops and livestock; Decreased livestock health; Loss of grazing areas; Conflicts among pastoralists and farmers over land use and resources	Strengthen agriculture extension services to support community-based climate-smart agriculture including improved seed and crop management practices; Improve animal health systems to reduce the vulnerability of pastoral communities to climate change; Identify and introduce drought and disease resistant varieties of crops with shorter maturity and higher yields; Provide insurance to help farmers, especially smallholder agriculturalists and pastoralists by enhancing their resilience and reducing risk when investing in agriculture and animal husbandry; Establish and strengthen farmers' organizations and CBOs and establish capacity building, demonstration and support programs to encourage climate-smart agriculture; Support local seed production and private sector led seed development system; Undertake innovative and integrated pest and disease control for crop pests and diseases; Improve post-harvest crop handling and resilience of value chains, including improved regulations and phytosanitary procedures
South Sudan	Agriculture, Livestock and Fisheries	Increasing temperatures; Shifting precipitation patterns; Floods; Droughts	Reduced fish populations and aquatic diversity; Decreased access to fishing sites; Disappearance of migratory fish species	Provide fingerlings, feed production and the appropriate tools and equipment for community managed fisheries and aquaculture ventures; Conduct studies on potential climate impacts on fisheries and formulate climate-smart strategies to increase fisheries productivity; Conduct studies and research to support the

				commercialization of fisheries and establish capacity building program to empower fisheries entrepreneurs and to utilize climate resilient fisheries management practices, climate resilient inland and village pond management; Promote sustainable value chain development to utilize climate resilient fisheries management practices, climate resilient inland and village pond management; Conduct research on and promote traditional fishing regulations that contribute to resilience and sustainable use; Incorporate observed and projected climatic changes into fishery policies, regulations and institutions to improve resilience fish production
South Sudan	DRR	Droughts; Floods	Increased crop losses; Loss of pasture lands and water resources for livestock; Reduction of critical habitats for biodiversity in wetlands and forests; Reduction in river flows; Adverse impacts on key habitats in wetland ecosystems	Utilize climate data and projections to develop disaster risk maps for flooding, drought, earthquakes and crop pests; Establish toolkit and capacity development/demonstration program for ecosystem-based disaster management and climate change adaptation; Implement reforestation and tree planting (including fruit trees and indigenous species) to reduce land degradation and soil erosion in South Sudan; Rehabilitate and expand hydrometeorological monitoring network to support improved early warning capabilities; Increase knowledge of climate change and environmental issues through a national awareness raising campaign and inclusion in school curricula; Develop mechanisms to reduce water-borne diseases with complementary awareness raising program
South Sudan	Environment. Ecosystems and Biodiversity Conservation	Increasing evapotranspiration; Droughts; Increasing temperatures; Shifting precipitation patterns	Shrinked wetlands; Increased competition for non-timber forest products; Reduction of habitats and spawning areas for fish rivers; Reduced food for wildlife; Reduced forest density; Increased incidence of wildfires; Changes in flowering and growing cycles	"Establish and incorporate mechanism for coordination with NAP in National Biodiversity Coordination Framework; Incorporate EbA considerations into national policy review and regulatory/policy revisions conducted under NBSAP; Identify appropriate targets, indicators and means of verification for climate change into Integrated National Biodiversity Monitoring, Assessment and Reporting System; Conduct research on high conservation value wildlife habitat vulnerability to changing climate conditions; Conduct climate change analyses to inform expansion of the protected area network of South Sudan; Promote conservation measures that protect biodiversity and increase ecosystem resilience; Incorporate data needs for Integrated National Biodiversity Monitoring, Assessment and Reporting system into hydrometeorological network; Develop and implement procedures to incorporate climate change adaptation functions (e.g., avoided costs and losses due to future climate change shocks and stressors) into national biodiversity and ecosystem valuation system; Support community-based sustainable utilisation and management of wetlands in selected parts of South Sudan; Promote afforestation of

				degraded landscapes and watersheds using multi-use forest species (agroforestry) to increase community safety nets and diversify livelihoods"
South Sudan	Energy	Shifting precipitation patterns	Reduced generating capacity; Increased siltation rate in hydropower station reservoirs; Decreased efficiency of power generation	Conduct analysis to determine potential climate impacts under different scenarios on electricity demand and generation capacity to inform National Electricity Policy; Establish regulatory framework, procedures and guidelines to ensure climate resilience is incorporated into the design of new energy generation and transmission infrastructure and the retrofitting of existing infrastructure; Promote the generation and use renewable energy and distributed energy generation to enhance local resilience; Promote energy saving technologies, such as improved charcoal stoves, biogas and solar; Establish incentives program to promote LPG and electrical cars and associated infrastructure
South Sudan	Human settlements	Increasing temperatures; Heat waves	Exacerbated urban heat island effect; Potential migration from rural to urban areas	Identify vulnerabilities and create resilience for communities living in montane areas in the face of climate change; Reduce vulnerability of population by integrating climate change considerations into land use planning; Ensure that building codes reflect the expected impacts of climate change; Develop improved flood risk maps for urban areas; Create map and buffer zones and relocate vulnerable communities away from flood prone areas; Develop risk maps and regulatory codes to inform solid and liquid waste disposal site selection and management; Develop regulatory codes and guidance materials based on future climate change scenarios to ensure new investments in water and sanitation infrastructure are resilient to climate shocks and stresses; Build climate resilient WASH infrastructure in regional capital cities
South Sudan	Industry, infrastructure and transportation	Floods; Increasing temperatures; Landslides	Damage and destruction of infrastructure; Damage to transport infrastructure	Improve environmental management in the oil industry to reduce the impacts of floods and droughts on industry infrastructure and operations; Build flood protection infrastructure including, improved drainage systems, flood barriers and retention areas; Conduct vulnerability assessments of existing infrastructure under current and projected climate change conditions to inform planning and design; Compile hazard maps (e.g., flooding, earthquakes and landslides) featuring current and projected exposure zones; Compile best practices and develop climate proofing/resilience guidelines for infrastructure design, construction and maintenance
South Sudan	Tourism and recreation	Droughts; Increasing temperatures; Shifting precipitation patterns	Degraded landscapes and loss of biodiversity will reduce attractiveness as nature-based tourism	Establish and disseminate principles for climate-adaptive sustainable ecotourism development; Develop capacity building program for rural communities to support nature-based (ecotourism) and cultural tourism; Develop licensing and branding

			destination; Continue resource-based conflicts in rural areas will diminish potential for cultural tourism	framework to register and promote rural ecotourism ventures; Establish community grants program to catalyze community-based tourism businesses; Develop climate resilient and sensitive road infrastructure and tourism facilities in national parks and game reserves; Identify local and regional human drivers of ecosystem degradation and wildlife exploitation and develop strategies for shifting behaviours to support ecosystems and biodiversity; Conduct research on wildlife species habitat and ecosystem vulnerability to changing climate conditions focusing on Sudd wetland, Boma-Jonglei landscape and Imotong, Didinga and Dongotono mountains; Establish regulatory framework to promote climate-smart tourism and to avoid maladaptive investments in tourism sector
South Sudan	Health	Heat waves; Increasing temperatures; Floods	Increased deaths from cardiovascular and respiratory disease; Water and vector-borne diseases; Mental health issues, especially among youth	Conduct comprehensive vulnerability assessments in the health sector under current and future climate change scenarios; Mainstream climate change, including future climate scenarios, into health sector strategies, plans and policies; Establish research program to understand the impacts of climate change on the health of vulnerable groups; Establish a training program on climate change related health risks for health sector workers, with special focus on community health workers (CHW); Develop action plans and strategies to control infectious diseases and vectors; Establish surveillance system for tracking current and emerging disease risks; Develop monitoring guidelines and train CHWs to monitor climate change related health threats; Expand capacity for modelling and forecasting climate related health effects; Develop risk maps to identify areas and populations most susceptible to climate change related health hazards (e.g., heat, disease); Promote climate health education in school curricula; Establish targeted public information and messaging campaign to promote risk reducing behaviour change in communities and to raise awareness on climate change induced diseases, with special emphasis on highly vulnerable groups
South Sudan	Water resources	Increasing temperatures; Increasing evapotranspiration; Droughts; Floods	Drops in the water table; Reduction of wetland size; Decreased recharge rates; Increased potential for conflict over water resources; Decreased water surface water quality; Increased sedimentation of	"Enhance access to water considering growing climate threats through integrated watershed management, wetland management and improved waste management; Establish pilot program for climate-smart integrated water resource management, including capacity development and demonstration project; Promote the formulation of water resource management plans at all levels of government; Build institutional capacity in water resources management; Introduce and expand water reservoir water management approaches; Promote harvesting and retention of

			watercourses; Reduced sanitation	water for different users through community-based watershed management (e.g., contour/assess hydropower dams, channel maintenance, afforestation); Improve ground water recharge and soil moisture retention through community-based soil and water conservation measures; Enhance resilience to drought through creation of water points; Introduce rainwater harvesting, recycling and water savings techniques and technologies to communities and households; Establish regulatory and monitoring measures to prevent water pollution and to discourage wetland encroachment by settlement"
Sudan	Water resources - Darfur States	Droughts; Increasing temperatures; Shifting precipitation patterns; Windstorms	Alterations in ecosystems that threaten food security, livelihoods and other services; Conflicts over water resources; Migration of herders; Decline of groundwater levels; Pollution of water	Maintenance of water points; Construction of water services; water harvesting project for agriculture; Construction of dams, hafir and water yards; Expansion of ponds; Drilling groundwater; Construction of pumps and wells
Sudan	Agriculture and natural resources - Darfur States	Increasing temperatures; Droughts; Shifting precipitation patterns; Windstorms	Reduced soil fertility; Degradation of natural environments, including forests and water catchments; Decrease of crop production; Conflicts between farmers and herders; Migration of wild animals	Management of the range lands and grazing in a sustainable manner; Rehabilitation of the natural range lands and management of animal rotes; Environmental and forest conservation; Soil conservation measures and best practices; Horticultural crops and agricultural project development; Diversification of households' income; Establish rural women development programme
Sudan	Health - Darfur States	Increasing temperatures; Shifting precipitation patterns; Droughts; Windstorms; Heavy rains; Floods	Spread of water-borne diseases such as malaria; Spread of epidemics such as yellow fever and cholera; Malnutrition	Protecting water resources from pollution; Combating vectors and insects that borne diseases; Improving primary health care services; Improve environmental sanitation services; Improving the general health services and build awareness; Eradication of intestinal worms; Health education; Community empowerment; Provision of clean safe water; Provision of vaccines
Sudan	Agriculture and natural resources - Kordofan States	Shifting precipitation patterns; Droughts; Floods	Crops season failure; Lack of food security; Deterioration of rangelands; Deterioration of forests; Spread of insect pest and disease	Water harvesting for crop and rangelands production; Introduction of early mature varieties; Improve nutritional value of crops residues; Introduction of perennial rangelands plants; Establishment of EWS; Mapping flood areas; Establish a disaster management unit; Reforestation; Agroforestry

Sudan	Livestock - Kordofan States	Shifting precipitation patterns; Increasing temperatures; Droughts; Floods	Deterioration of rangelands; Poor pasture; Diseases outbreaks	Herd restocking; Supplementary feeding; Improvement of animal breeds by selection; Support of income generating activities (bee keeping, poultry improvement; Animal health awareness; Pastoral and therapeutic camps; Rehabilitation of rangelands through seeds dispersals and water harvesting
Sudan	Water resources - Kordofan States	Shifting precipitation patterns; Droughts; Heat waves; Windstorms; Increasing evapotranspiration	Water pollution; Deforestation; Lack of safe drinking water	Undertake geophysical studies of the aquifers; Establishment and rehabilitation of hand pumps; Digging and rehabilitation of Hafirs; Establishing water networks in the rural areas (provisions of drinking water); Building capacities to achieve integrated water resource management; Drip irrigation; Water harvesting
Sudan	Health - Kordofan States	Shifting precipitation patterns; Increasing temperatures; Droughts; Windstorms	Malnutrition diseases; Spread of malaria; Respiratory system diseases; Water-borne diseases; Eyes diseases	Cleaning and purification of drinking water; Construction of latrines in villages; Establishment and rehabilitation of health centers; Building the capacities of the health cadres; Supporting family and school health programmes; Promotion of ventilated improved latrines; Combating transmitted disease; Raising the health awareness of the communities; Raise awareness of women hygiene;
Sudan	Water - Eastern States	Shifting precipitation patterns; Increasing temperatures; Droughts; Floods	Decline of water resources; Conflicts; Epidemic diseases; Desertification	Introduce suitable water harvesting techniques; Adoption of modern irrigation systems; Establishment of hafirs; Digging wells; Installing hand pumps; Establishment of water quality and desalination laboratories
Sudan	Agriculture and natural resources - Eastern States	Shifting precipitation patterns; Increasing temperatures; Droughts; Floods	Reduction of crop production; Deterioration of land vegetation cover; Reduction of animal production; Desertification; Migration of villagers to neighbouring towns	Breeding of crop varieties that are adapted to the climate change; Introduction of modern irrigation technologies; Introduction of community forest; Provide capacity building to rural people; Rehabilitation of the Gum Arabic gardens; Collection of tree seeds and planting them; Establishment of tree nurseries
Sudan	Health - Eastern States	Increasing temperatures; Shifting precipitation patterns; Droughts; Floods	Spread of water-borne diseases; Increase malnutrition; High ratio of maternal and child mortality	Establishment of dispensaries and health centers; Provision of primary health care services; Raising health awareness; Adoption of control measure for malaria; Waste collection and recycling; Improvement of toilet systems; Provision of water quality testing equipment; Eradicate mosquitos from potential water resources
Sudan	Livestock - Eastern States	Shifting precipitation patterns; Increasing temperatures; Droughts; Floods	Animal deaths; Deterioration of animal routes; Deterioration of pastures and appearance of unpalatable species; Soil degradation	Development of fish farms; Establish pastoral farms and nurseries; Opening of fire lines; Controlling of diseases shared between humans and animals; Provision of production facilities (animals, boats, nets, etc.); Conservation of aquatic and terrestrial ecosystems; Mobile vet clinics

Sudan	Education - Eastern States	Shifting precipitation patterns; Droughts; Floods	Decrease in agricultural and animal production; Poor pastures; Instability	Improve education infrastructure and reduce illiteracy; Introduce concept of climate change in education; Raise awareness about climate change among decision-makers; Engage women in productive associations and committees; Creation of database and information unit; Exchange visits between States to share their experiences
Sudan	Coastal Zones - Eastern States	Increasing sea surface temperatures; Sea level rise; Shifting precipitation patterns	Inundation of wetlands; Coastal erosion; Intense floods; Saltwater intrusion into groundwater sources	Protection of critical areas, specifically areas sensitive to climate related risks; Management of mangrove areas and addressing multiple stresses using approaches based on science and participation; Provisions for alternative livelihoods for mangrove dependent communities to address drivers for mangrove destruction; Integration of adaptation options into coastal zone management planning to increase adaptive capacity of ecosystems and people; Assessment and monitoring of coastal ecosystems (including area, resources, resilience etc); Integration of ecosystem based and resilient building approaches in coastal zone management and development; Exploration of options for investment and finance flow to support ecosystems conservation and maximization of their benefits to livelihoods
Sudan	Water - Nile States	Droughts; Shifting precipitation patterns; Increasing evapotranspiration; Increasing temperatures; Windstorms	Loss of water supply; Population migration; Rangelands and grass species decrease; Livestock decrease; Sand dunes movement; Desertification; Soil salinity	Digging water wells; Water harvesting though hafirs; Regulations for careful use of modern irrigation systems; Digging boreholes; Monitor quality of drinking water
Sudan	Health sector - Nile States	Increasing temperatures; Windstorms	Increase of respiratory and eye diseases; Allergic and skin diseases; Urinary tract infection	Provision of basic health services; Malaria eradication program; Establish treatment centres; EWS for disease spread; Create partnership to face health risks resulted from climate change; Vector control (chemical and environmental control); Insurance of medicines stock during disasters and emergencies; Training of workers; Afforestation
Sudan	Agriculture and Livestock - Nile States	Floods; Increasing temperatures; Shifting precipitation patterns; Droughts; Increasing evapotranspiration; Windstorms	Decreased soil fertility; Decreased livestock production; Decrease of rangelands area; Water canals affected by sand accumulation; Desertification; Bank erosion, Early flowering in palm trees	Provisions of improved early maturing varieties; Rangelands improvement (rehabilitation and management); Crop diversification and introduction of improved varieties; Improving the current irrigation systems to suit the fluctuations of the River water flow levels; Provision of small irrigation pumps to the farmers; Establishing of shelterbelts, community forests and agroforestry; Increasing productivity through selection of the best breeds; Improving the veterinary services and the abattoirs; Aquaculture

				and sustainable fishing; Studying the impacts of climate change on the production of fruits especially date palm.
Sudan	Agriculture and natural resources - Central States	Increasing Temperatures; Increasing Evapotranspiration; Floods; Windstorms; Droughts	Incidence of new insect pests; Loss of crops; Decreased crop yields; Low soil fertility; Reduction in flowers abortion; Shortages of water	Using suitable agricultural technology and best practices to cope with climate change; Breeding of new crop varieties that are more adaptive to climate change; Rehabilitation of the vegetative cover; Rehabilitation of the rangeland; Selecting stress-tolerant species; Designing canals for improving utilization of floodwater; Protecting horticultural crops through agroforestry; Modern irrigation systems
Sudan	Health - Central States	Shifting precipitation patterns; Floods; Increasing temperatures; Heat waves; Droughts; Windstorms	Physical injuries; Damage to houses; Disruption of medical supply and health services; Spread of meningitis; Water pollution; Water-borne diseases; Increase in diarrheal and malaria diseases	Raise awareness about interlinkages between climate change and human health; Health education and training; Improve drug supply; Control of malnutrition and diarrhea among children under five; Provision of treatment and basic medical services; Early warning and response to health emergencies; Research on climate vector-borne diseases; Increase capacity in local health policy and program implementation
Sudan	Water resources - Central States	Increasing evapotranspiration; Shifting precipitation patterns; Windstorms; Droughts; Floods	Water loss; Crop loss; Shortages of drinking water; Water-borne diseases; Saltwater intrusion; Desertification;	Proper planning and improving water harvesting techniques; Construction of boreholes; Management of surface and underground water; Introduce technology to enhance communal water storage systems; Enforcement of environmental laws; Upstream and downstream cooperation
Timor-Leste	Infrastructure	Landslides; Floods; Coastal erosion	Extreme events impact on infrastructure will lead to damage and degradation of assets such as water supply and drainage structures, embankments and river protections, and community-level feeder/access roads and bridges	Identify and map all and the appropriate and effective climate proofing measures that have been practiced in the country and in the region; Improve physical infrastructure and natural vegetation methods to prevent landslides in hill sides, roads, and river banks that are made vulnerable by climate change; Develop a Climate Risk Zone Map disaggregated by key climate risks to guide the infrastructure development projects; Promote climate resilience and climate proofing approaches in small, medium, and large scale infrastructure; Integrate climate resilience aspects into the Environmental Impact Assessment (EIA) regulations and introduce provisions to make the EIA mandatory for all infrastructure development activities
Timor-Leste	Biodiversity and Ecosystem	Floods; Droughts	Loss of biodiversity	Prepare a climate risk and climate sensitive land use, biodiversity and natural resource management plan; Explore and map the potential of different natural resources such as stones and minerals, forest land, oil and gas and prepare an analysis of potential versus climate risk of each of these key natural resources; Include

				ecosystem management in national planning; Develop and prioritize natural resource management measures in alignment with the priorities set by sectorial ministries for forests, grazing land, mines, stone quarries, water resources and hydropower resources
Timor-Leste	Health	Increasing temperatures; Heat waves; Floods; Droughts	Higher temperatures and longer heat waves will increase the incidence of heat-related diseases and vector-borne diseases such as malaria and dengue fever, heat-related mortality, undernutrition, diarrheal diseases; Disruption to healthcare services due to extreme weather events	Integrated disease surveillance and early warning systems; Support the development of health database and data management systems which includes climate sensitive health risk and vulnerability information to facilitate effective, targeted and efficient delivery of health services; Reviewing all existing guidelines, standard operating procedures to consider climate change and its adverse effects; Coordinate with the Ministry of Health to integrate climate change adaptation and mitigation in health sector policies including WASH priorities
Timor-Leste	Agriculture	Increasing temperatures; Shifting precipitation patterns; Sea level rise	Disruptions to agricultural productivity and availability of food supply	Map all the climate smart agricultural practices existing in Timor-Leste and identify the best practices that have contributed in climate change adaptation; Conduct assessments to identify vulnerability and resistance of the major crops to different climate risks and an action plan to safeguard the agricultural land and production; Support research and studies to explore the livestock breeding programs which can adapt better to the climate risks; Facilitate national level, local level and transboundary dialogue to explore the solutions to adapt to and combat the negative impacts of climate change on the health and productivity of livestock; Develop integrated agroforestry and watershed management; Promote research on different types of aquaculture techniques and technologies; Advocate for sustainable harvest of fish and promote sustainable fishing techniques; Explore the potential of developing recreational fisheries as one of the options for eco-tourism; Promote community-based and integrated watershed management approach to contribute towards co-benefits of sustainable agricultural options
Timor-Leste	Water	Shifting precipitation patterns; Sea level rise; Heavy rains; Increasing temperatures; Increasing evapotranspiration; Floods	Negative pressure on groundwater resources; Saltwater intrusion; Decline of water quality and quantity; High levels of catchment degradation; Outbreaks of water-borne diseases	Develop integrated agroforestry and watershed management, including integrated water resource management approaches; Enhancing government and community strategies to respond to drought; Improve water management including developing and utilization of rainfall harvesting technologies particularly in high prone drought areas; Protection and rehabilitation of rainfall catchment areas should be accelerated to ensure sustainable water supply; Create new or strengthen existing Water Management Groups at the community level; Integrate water conservation, water

				use management, and climate risk reduction approaches into Tarabandu; Build climate proof and environmentally sustainable infrastructure to protect water resources, including enhancing water harvesting, distribution and management systems
Timor-Leste	DRR	Earthquakes; Tsunamis; Cyclones; Heavy rains; Floods; Droughts	High rates of mortality	Improve institutional and community (including vulnerable groups such as women and children) capacity to prepare for and respond to climate change-induced natural disasters; Improving early warning systems for disasters; Integrated climate risk information into traditional disaster risk reduction and management
Timor-Leste	Tourism	-	-	Support assessments to find out the potential climate change stress and loss and damage potential on the tourism sector and the tourism sector on the natural resources; Promote eco-tourism with adequate environmental management aspects integrated into the eco-tourism approach
Timor-Leste	Coastal Systems and Marine Resources	Increasing temperatures; Sea Level Rise; Ocean Acidification; Coastal erosion	Mangrove forests degradation; Degraded reef and ecosystem health; Damages to roads; Out-migration to urban centres; Coral reef degradation; Decline in fish stocks	Maintain mangrove plantations and promote awareness to protect coastal ecosystems from impacts of sea level rise; Ensure that the climate change adaptation interventions are well integrated into the coastal and mangroves rehabilitation and protection policy instruments
Togo	Agriculture	Increasing temperatures; Droughts; Floods; Sea level rise	Reduction in the supply of food; Degradation of pastures, the death of livestock, the decline in the income agro-pastoralists and rural exodus; Disruption in the fish productivity cycle; Species migration; Saltwater intrusion; Floods will cause the proliferation of parasitic microorganisms' plant and insect pests	Construction and/or rehabilitation of water reservoirs for micro-irrigation and livestock watering in rural areas; Promotion of high-performative varieties resilient to climate change; Fight against land degradation by strengthening integrated management of soil fertility
Togo	Water resources	Droughts; Shifting precipitation patterns; Heat waves	Climate change will have consequences on the proliferation of floating plants (salad water, water hyacinth, etc.) due to the reduction of the flow	Conservation of rainwater and reuse of wastewater; Improvement of water management in the agricultural sector; Increase knowledge on available water resources

			velocity of watercourses, change in their temperature as well as the deterioration of water quality. These plants provide ideal conditions for multiplication vectors of water-related diseases such as malaria and suffocate water bodies in areas wet.	
Togo	Coastal erosion	Floods; Coastal erosion; Sea level rise	Floods will affect 50% of population and 80% of infrastructure located along the coast; Coastal erosion will cause decline of coastline between 160m and 240m; Saltwater intrusion in fresh aquifers and soil	Improvement of the regulatory framework and knowledge management of the coastal erosion phenomenon; Realization of structuring investments to protect the coast and raise the level of resilience
Togo	Human settlements	Floods; Heavy rains; Landslides	Precarious housing and shelters located in low-lying areas will be destroyed by flooding; Erosion caused by heavy rains will strengthen the loosening of house foundations and landslides; Floods will also have serious impacts on infrastructure roads	Sustainable management of waste in urban areas; Strengthening stormwater drainage in the main urban centres; Development and rehabilitation of urban roads in the main urban centers
Togo	Health	Floods; Droughts; Increasing temperatures	Increase of diseases like malaria and cholera due to floods; Increase of meningitis and cardiovascular diseases due to droughts and higher temperatures	Development of emergency medical services; Development and implementation of a national health surveillance plan
Togo	Land use, land use change and forestry	Increasing evapotranspiration; Increasing temperatures; Droughts; Sea level rise;	Timber production potential will be negatively impacted; Reduction in forest formations; Saltwater	Reforestation and protection of areas with fragile ecosystems to fight against floods, strong winds and erosion; Capacity building (technical and material) of meteorological services for good forecasting and planning of activities

		Land degradation; Heavy rains	intrusion will negatively affect productivity of mangroves; Heavy rains erode the sides of the hills and mountains following the disappearance of plant cover; Overall energy deficits	
Togo	Energy	Droughts; Increasing Evapotranspiration; Land degradation; Heat waves	Droughts and forest degradation will affect national wood energy potential; The increase in evapotranspiration would affect the hydroelectric potential by 7.2%. A greater deficit in hydroelectric power that can vary between 27 and 36% will be noted by 2050	Sustainable management of traditional energies (firewood and charcoal); Implementation of electric energy saving strategies; Development of hybrid mini grids for rural electrification