Mobilising Climate Change Data Ecosystems: A Framework and Toolkit

Climate change affects every country in the world, but how and to what extent countries are affected differs greatly. However, persistent data gaps, resource and capacity constraints, lack of appropriate legal and regulatory frameworks, and ineffective co-ordination between and across relevant stakeholders are limiting the use of data for climate action.

To help inform national as well as international action to tackle climate change, PARIS21 has developed the Mobilising Climate Change Data Ecosystems Framework (CCDE). Climate Change Data Ecosystems are communities of interacting state and non-state data actors, the legal and policy environment in which they operate, and the technologies to create, transform and use climate change-related data and statistics.

The framework is targeted at national or international actors working on climate change data and who wish to strategically strengthen data for climate action. It guides the data community through a four-step process to identify data gaps, prioritise crucial data and capacities for climate action, and mobilise resources and actors to facilitate evidence-based decision making. The framework also contains a set of tools to implement the four steps.

The CCDE framework and toolkit were produced with support from:

About PARIS21

The Partnership in Statistics for Development in the 21st Century (PARIS21) promotes the better use and production of statistics throughout the world. Since its establishment in 1999, PARIS21 has successfully developed a global network of statisticians, policy makers, analysts and development practitioners committed to evidence-based decision making. PARIS21 works with governments, international organisations, civil society, and other stakeholders to strengthen national statistical systems, promote the use of data for policy making, and foster partnerships and networks in low and middle-income countries.

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Foreword

Climate change poses serious risks to people, biodiversity and the world economy. The multiplier effect of its impacts on food security, human health, poverty alleviation, economic growth and other development areas make climate change "the most important global systemic threat", in the words of United Nations Secretary-General António Guterres (2019[1]). The availability and coherent use of climate change data are crucial to help societies adapt to new climate realities. Evidence-based decision making can better identify both risks and vulnerable populations and contribute to developing more effective climate change policies that build resilient societies (Marek et al., 2021[2]).

Climate action needs to be accelerated at global, regional, national and local levels. Timely, high-quality, and fit-for-purpose climate change data are crucial to accompany, underpin and accomplish climate action. These data can take various forms including official statistics, citizen-generated data, and data from research institutions and the private sector. More and better data not only facilitate meeting international reporting requirements under the Paris Agreement and the 2030 Agenda for Sustainable Development. They also support efforts to monitor national climate mitigation and adaptation actions. Leveraging the power of data enables countries to better understand the local effects of climate change as well as monitor progress towards reducing vulnerabilities, mitigating impacts and driving evidence-based climate action.

The Partnership in Statistics for Development in the 21st Century (PARIS21) promotes the development and implementation of a systems approach to climate change data to unlock the power of such data for more effective reporting and climate action in low-resource and low-capacity contexts. At the request of national statistics offices (NSOs) and governments, PARIS21 has developed a practical framework for NSOs, ministries of environment and other actors working with climate change data that provides tools and templates to assess and mobilise their climate change data ecosystems (CCDEs) through a data action plan. This framework also aims to foster greater co-ordination and mobilise all key actors in the CCDE to improve the production, communication and use of climate change-related data.

The concept of a CCDE and the vision to operationalise it were introduced at the 2021 PARIS21 Fall Meetings and at a subsequent Expert Workshop that launched this journey and served to clarify how an effective CCDE can be helpful for evidence-based climate action. At the 2022 PARIS21 Spring Meetings, the scoping paper Envisioning a Climate Change Data Ecosystem: A Path to Co-ordinated Climate Action (PARIS21, 2022[3]) formalised the concept and ideation process.¹

The Mobilising Climate Change Data Ecosystems Framework was created in alignment with the PARIS21 2021-25 Strategy and its three pillars: accelerate innovation, bridge data ecosystems and develop statistical capacity (PARIS21, 2021[4]). By supporting countries in identifying climate data priorities, filling data gaps and promoting policy-responsive climate data systems, this Framework can provide key insights that help mainstream climate concerns in statistical production. The Framework is anchored in over 20 years of PARIS21 experience supporting the design and implementation of national strategies for the development of statistics and a similar approach to strategic planning.
Acknowledgements

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Mobilising a climate change data ecosystem (CCDE) can help governments and climate data stakeholders develop and effectively use data to support evidence-based decision making in the area of climate change.

A CCDE is a community of interacting state and non-state data actors, the legal and policy environment in which they operate, and the technologies to create, transform and use climate change-related data and statistics (PARIS21, 2022[3]; PARIS21, 2019[5]).

Existing CCDEs are highly fragmented, and current frameworks fall short of increasing integration and prioritising data needs for policy making. Among the key challenges to be tackled are persistent data gaps, resource and capacity constraints, lack of appropriate technology and infrastructure, and ineffective co-ordination between and across relevant stakeholders as well as weak legal and regulatory frameworks (PARIS21, 2022[3]).

Figure 1. When to use the Framework

The Framework is complemented by a set of tools to be used across the four steps of the process as shown in Figure 2. All tools in editable format are available here. 
The PARIS21 Mobilising Climate Change Data Ecosystems Framework presents a practical, four-step model with complementary tools for ministries of environment (or analogous), national statistical offices (NSOs), and other actors in the climate change data arena:

- **Step 1.** Identify a core set of priority indicators that can help monitor climate change in a country and are rooted in national and global commitments.
- **Step 2.** Assess the state of the national CCDE, including existing data and capacity gaps.
- **Step 3.** Engage key actors of the CCDE who can contribute to strengthening climate change data production and use.
- **Step 4.** Develop and implement a climate change data strategic plan aimed at mobilising stakeholders and resources.

This document, organised in two parts, first sets the stage for mobilising the Framework and then provides practical step-by-step guidance for implementing it. Part 1 outlines the context and definitions related to CCDEs and presents implementation guidelines for the use of the Framework’s five tools. It also includes a section on lessons learned during the initial implementation of the Framework in 2023 in collaboration with national actors in Belize, Grenada, Lao PDR and Senegal. In Part 2, the four steps (as shown above) for mobilising CCDEs are explained.

Climate change data actors should use and adapt the PARIS21 Mobilising CCDEs Framework to take account of the realities in their context and in line with the objective they would like to achieve. For example, the Framework could be used exclusively to either assess and plan the production of climate change Sustainable Development Goals, ensure data availability for the biennial transparency reports of national determined contributions, or develop Monitoring, Reporting and Verification systems focused on adaptation as shown in Figure 1.
## Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADAPT</td>
<td>Advanced Data Planning Tool</td>
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<tr>
<td>CCDE</td>
<td>Climate change data ecosystem</td>
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<td>CISAT</td>
<td>Climate Change Statistics and Indicators Self-Assessment Tool</td>
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<td>CSO</td>
<td>Civil society organisation</td>
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<tr>
<td>ESSAT</td>
<td>Environment Statistics Self-Assessment Tool</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
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<td>NAP</td>
<td>National adaptation plan</td>
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<td>NDC</td>
<td>Nationally determined contribution</td>
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<td>NDP</td>
<td>National development plan</td>
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<td>NSDS</td>
<td>National strategy for the development of statistics</td>
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<td>NGO</td>
<td>Non-governmental organisation</td>
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<tr>
<td>NSO</td>
<td>National statistical office</td>
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<td>NSS</td>
<td>National statistical system</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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<td>UNSD</td>
<td>United Nations Statistics Division</td>
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<td>SDG</td>
<td>Sustainable Development Goal</td>
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Part 1

Setting the scene
Why do climate change data ecosystems matter?

Defining climate change data

Climate change data and climate change-related statistics are used interchangeably throughout the Framework to allow for flexibility, as not all actors produce and use only statistics. However, it should be highlighted that data is the raw information from which statistics are created. Climate change-related statistics are "environmental, social and economic data that measure the human causes of climate change, the impacts of climate change on human and natural systems", and mitigation and adaptation efforts (UNECE, 2014, p. iii[6]). This broad approach to climate change data encompasses its wide variety of types, uses, and socioeconomic and cultural aspects that go beyond the measurement of climate variables. The Framework for the Development of Environment Statistics (UN, 2017[7]) and the Global Set of Climate Change Statistics and Indicators (UNSD, 2022[8]) developed by the United Nations Statistics Division (UNSD) provide guidance to identify and narrow the key domains and sectors related to climate change data and statistics. These tools by UNSD allow countries to identify their priorities in the areas of environment and climate change. Figure 3 presents some universal topics that are covered by climate change data.

Figure 3. Scope of climate change data

Scope of climate change data

Source: Authors based on UNSD (2022[8]), Global Set of Climate Change Statistics and Indicators and IPCC (IPCC, 2023[9]), Summary for Policymakers.
**What is a climate change data ecosystem?**

PARIS21 defines a climate change data ecosystem (CCDE) as a community of interacting traditional national statistical system (NSS) actors and non-state actors including civil society, the private sector, academia, and regional and international agencies; the legal and policy environment in which they operate; and the available information, infrastructure and technologies to create, transform and use climate-related statistics and data. Figure 4 is an illustrative example of what a CCDE could look like in a country.
Why mobilise climate change data ecosystems?

CCDEs exist by default. But they remain highly fragmented, and there is a need to systematically address capacity and financial needs to strengthen them. While the exponential increase in climate change-related data has led to a “data tsunami”, the rapid growth of information has not included a process of reimagining data collection, data sharing and data access (Brett et al., 2020[10]).

At the same time, CCDEs face multiple challenges that are aggravated by the complexity and scope of climate change alongside an ever-growing and evolving demand for information. Some key factors that affect climate change data include lack of co-ordination among statistical producers, underdeveloped data-sharing practices, and lack of resources and statistical capacity (PARIS21, 2022[3]).

Adopting an ecosystems approach offers a number of benefits: It can improve the availability, dissemination and use of data; identify strategies for sustainable climate change data; and support the means of implementation for climate action, notably capacity development; and enable more effective resource mobilisation. Box 1 provides an example of how mobilising the climate change data ecosystem in Rwanda helped measure the impact of climate change in agriculture.

**Box 1. Rwanda: How mobilising the CCDE helped effectively measure the effects of climate change on agriculture**

Using geospatial data and other forms of statistics, the National Institute of Statistics Rwanda (NISR) has built a community of climate change practitioners to track the implications of climate change on agriculture, food security, water, ecosystems management and other critical areas for the country.

A sectoral working arrangement between the NISR and key stakeholders allows for follow-up on these issues and enables the use of geospatial data to plan and implement a regular agricultural survey over the different seasons of the year. Information derived from these surveys enables measurement of the impacts of climate change on agriculture and food security in Rwanda.

To strengthen the production and use of climate change data, the NISR recommend that countries:

- start with plans for what statistics offices need regarding climate change statistics
- establish working arrangements with partners around climate change
- integrate the climate change work into the national strategy for the development of statistics and monitor the implementation of these efforts

Source: Interview with Yusuf Murangwa, director general of the NISR, during the PARIS21 Fall Meetings 2022. Link here
Implementing the PARIS21 Mobilising Climate Change Data Ecosystems Framework

The PARIS21 Mobilising Climate Change Data Ecosystems Framework aims to facilitate the identification of climate change data ecosystem (CCDE) stakeholders, including both state and non-state data actors’ their data systems and the enabling environment they operate in; and their potential roles and responsibilities to improve the production and promote the use of climate change data. Climate change data actors can adapt the Framework depending on the realities in their contexts and the specific outcomes they would like to achieve.

Figure 5. When to use the Framework

When to use PARIS21’s Mobilising CCDEs Framework

- **Strategic planning**: A national statistics system or one of its institutions are developing a strategic plan for national statistical production such as the national strategy for the development of statistics (NSDS)
- **Mapping data**: The country’s ministry of environment (or analogous) or statistics office wants to map the data related to climate change that should be produced in the medium term
- **Report planning**: When planning for the biennial transparency reports of nationally determined contributions or when developing a Monitoring, Reporting and Verification system
- **Collaboration**: An environment or climate change statistics committee has recently been formed and its stakeholders need to draw up a plan for collaboration
- **Working with development partners**: Development partners want to support the production of climate change statistics in a systemic manner, building capacity of the statistics system to produce climate change data sustainably
- **Government policy making**: When governments want to adopt climate financing mechanisms and identify what statistics are needed to unlock it.
The general objectives of the Framework and its tools are to:

- provide a framework for navigating across data silos, thereby increasing data interoperability, harmonisation and co-ordination mechanisms
- unlock data sharing across different actors of the CCDE (ministries, national statistical offices (NSOs), the private sector, academia and civil society)
- enhance the use of climate change-related data by more effectively aligning data demand and data supply and improving the capacity to use data for decision making
- mobilise new and existing climate finance flows by identifying potential partnerships and matching funding opportunities with priority needs for climate change data
- facilitate the involvement of NSOs in climate reporting as key enablers to improve the sustainability and co-ordination around climate change data.

The Framework can be used by NSOs, Ministries of Environment, or other actors engaged in climate change data when there is a need for strategic data planning in the area of climate change, when there is a need to respond to specific data demands from national climate plans or policies, or when there is a need to mobilise resources for climate actions. Figure 5 shows some concrete examples of when to use the Framework.

How to use this Framework

The PARIS21 Framework to mobilise CCDEs is composed of four steps, as summarised in Figure 6 below. The Framework and its tools will enable a meaningful engagement of CCDE stakeholders along the four steps. Steps 1 and 2 of the process aim to assess the current state of CCDEs at a national level. Steps 3 and 4 aim at developing a strategic plan to mobilise a coherent and effective CCDE.

Figure 6. The PARIS21 Mobilising Climate Change Data Ecosystems Framework process
The process of assessing and mobilising the CCDE involves four steps

Step 1 – Prioritising data demand

This step identifies and prioritises current national climate change data demands from national climate change plans or policies and required for international reporting, with the aim of defining a set of core priority indicators.

Step 2 – Assessing climate change data and statistical capacity

Building on the core priority indicators defined in Step 1, Step 2 assesses available data and data gaps to measure the identified indicators as well as capacity to produce and use climate change data.

Step 3 – Engaging key actors of the CCDE

Step 3 map relevant climate change-related data systems, the enabling environment of the CCDE, and the actors within and beyond the NSS, with the aim of identifying potential roles and avenues for strategic collaboration.

Step 4 – Strategic planning for an improved CCDE

Once the CCDE is mapped and its capacity assessed, the process continues with the development of an action plan to mobilise the CCDE and improve the production and use of climate change data.

Assessing the CCDE will allow countries to evaluate the capacity gaps that need to be addressed to mobilise an effective CCDE including statistical skills, climate literacy, and human and financial resources. The participatory design and implementation of the strategic action plan will then enable actors to define specific, costed objectives to develop capacities and skills and to mobilise resources for a more coherent and integrated production of climate change-related statistics.
Framework toolbox

The Framework toolbox consists of five tools to mobilise CCDEs, which can be found here\(^1\) and in Annex A. Figure 7 describes the tools and the steps they should be used in. Figure 8 summarises the objective of each tool. The tools can be used together or, if the aim is to accomplish only one of the objectives of the steps, separately.

**Figure 7. Framework toolbox**

**Figure 8. CCDE Framework tools explained**

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1. **Tool 1**: Data gaps Excel template (ADAPT)
   - **Objective**: Maps the demand for data from national and international development frameworks, current data production, and existing data gaps.

2. **Tool 2**: Capacity questionnaires (Word docs)
   - **Objective**: Assesses the statistical capacity of various actors in the CCDE, including the MoEnv, NSO, other state and non-state actors.

3. **Tool 3**: Results matrix for the capacity questionnaires (Excel sheets)
   - **Objective**: Compiles and organises the results of the capacity questionnaires for ease of analysis.

4. **Tool 4**: CCDE mapping tool (PowerPoint slides)
   - **Objective**: Visually maps the CCDE, including stakeholders, enabling environment, and supply and demand for climate data.

5. **Tool 5**: Strategic action plan template (Word doc and Excel sheet)
   - **Objective**: Provides a structure for formulating and implementing an action plan to mobilise the CCDE for climate action.
**Complementarity with other tools and frameworks**

The PARIS21 CCDE Framework complements existing tools and frameworks for climate change data. These include the Global Set of Climate Change Statistics and Indicators\(^2\)\footnote{Global Set} (Global Set) adopted at the 53rd session of the United Nations (UN) Statistical Commission in March 2022, the Environment Statistics Self-Assessment Tool (ESSAT),\(^3\)\footnote{ESSAT} the UNSD Climate Change Statistics and Indicators Self-Assessment Tool (CISAT),\(^4\)\footnote{CISAT} the UN Framework Convention on Climate Change (UNFCCC) Enhanced Transparency Framework,\(^5\)\footnote{UNFCCC Enhanced Transparency Framework} and the UN Economic Commission for Europe guidance on the role of NSOs in achieving national climate objectives.\(^6\)\footnote{UN Economic Commission for Europe guidance on the role of NSOs in achieving national climate objectives} These tools from developed by the UN are helpful for countries to better understand climate change data requirements as explained in Box 2 below.

The PARIS21 CCDE Framework can complement results from the ESSAT and CISAT by proposing a strategic follow-up to define actionable strategies to engage stakeholders and improve resources to close the data gaps identified through the ESSAT and CISAT. Furthermore, the CCDE Framework can help countries identify priority climate change indicators from the Global Set by raising awareness of the data demand from national policies, plans and strategies relevant to climate change.

The Framework also complements assessment templates such as the Open Climate Data Template (OCDT) developed by Open Data Watch and the Climate Data for Adaptation and Resilience Typology\(^7\) (Climate DART) developed by the Center for Open Data Enterprise (CODE). Climate DART is crafted to scrutinize the climate-related data necessities at the national level, and by tapping into global frameworks such as the Global Set, it identifies specific domains and pertinent elements linked to climate data.

In terms of data openness, the PARIS21 CCDE Framework can be complemented with the OCDT, which is inspired by the Open Data Inventory methodology\(^8\)\footnote{Open Data Inventory methodology} and captures adherence to open data standards. Complementarity takes different forms depending on the tool.

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**Box 2. Using the Global Set of Climate Change Statistics and Indicators: A practical tool to identify climate change-relevant indicators**

The UNSD developed the **Global Set of Climate Change Statistics and Indicators** following a global consultation process. As an overarching framework of climate change indicators, the Global Set reflects national priorities and sets minimum target indicators to track climate change in five key areas: drivers, impacts, vulnerabilities, mitigation and adaptation. It compiles a total of 158 indicators and 190 statistics grouped in different topics under each of the areas. The Global Set also includes the correspondence between each indicator and/or statistic and the main international reporting commitments under the 2030 Agenda, the Paris Agreement and the Sendai Framework.

As a complementary tool, the UNSD has developed the **Climate Change Statistics and Indicators Self-Assessment Tool** to offer UN member states an opportunity to undertake a thorough and detailed assessment of the statistics and indicators in the Global Set. In addition, the UNSD has published **Implementation Guidelines** that aim to help countries improve their monitoring of climate change and its impacts and response actions, including by more effectively informing the national climate policy authorities about the benefits of official statistics and by guiding the NSO to engage better in the area of climate change.

**The case of Suriname – A practical implementation of the Global Set**

The General Bureau of Statistics in Suriname adopted the Global Set framework to craft its [first report on climate change statistics and indicators](https://example.com). The report furnishes vital information about climate change for numerous multilateral environmental agreements including the Paris Agreement. Using the Global Set structure helps the NSO to identify statistics and indicators in areas where demand is growing for data crucial to informed decision making, such as the areas of mitigation and adaptation.
Notes


2 Available at UNSD — Environment Statistics.

3 Available at UNSD — Environment Statistics.

4 Available at UNSD — Environment Statistics.

5 Available at UNSD — Environment Statistics.

6 Available at Task Force on the role of national statistical offices in achieving national climate objectives | UNECE.


8 Available at Open Data Inventory—Global Index of Open Data - Open Data Inventory (opendatawatch.com).
Lessons learned on mobilising climate change data ecosystems

This section highlights ten recommendations compiled by PARIS21 during the implementation of the Climate Change Data Ecosystems Framework in Belize, Grenada, Lao PDR and Senegal in collaboration with the ministries of environment and statistics offices in these countries. The lessons learned emerged from the experiences in all four countries to varying degrees and reflect common challenges faced when mobilising the climate change data ecosystem (CCDE). This set of recommendations is anchored in the key principles for effective CCDEs developed by PARIS21 (2022[3]), which are co-operation and co-ordination; transparency, openness, and sharing; fit-for-purpose data; and resources and capacity.

Strengthen co-ordination for climate reporting

Demand is growing for climate change-related data to monitor, prevent and act on the impacts of climate change. In response, national statistical systems (NSS) have been establishing specialised units or inter-institutional mechanisms dedicated to the production of climate change statistics. The creation such units is bringing visibility and investment to the area of climate change data. But it has also led to duplication of efforts, inefficient use of resources and conflict among institutions due to overlapping and unclear mandates. Clarifying the roles different institutions play in climate reporting will help government agencies identify synergies in the NSS and low-hanging fruit solutions for collaboration with non-state actors. Based on experiences implementing the Framework in pilot countries, it is recommended that countries:

- develop statistical capacity holistically across the statistics system and CCDE, going beyond the ministry of environment and national statistical office (NSO)
- clarify the mandates, roles and co-ordination mechanisms linked to climate reporting
- learn and improve collaborations between the NSO and NSS, building on experiences with the 2030 Agenda
- identify quick wins for collaboration among state and non-state actors.

Enhance climate data localisation

Significant progress has been made in defining the key climate change areas that need to be monitored, particularly at the global level. However, ministries of environment and NSOs are struggling to identify a detailed list of indicators or data that need to be prioritised for climate change data production. It is important to clarify agendas and align data production to users’ needs, particularly the needs of policy makers taking decisions on climate action. By mapping and creating consensus around a core set of data demands, NSS agencies will be able to better target their data production and communication, thereby making the most of constrained capacities and resources. Additionally, creating a better understanding of data demanded for decision making will allow the CCDE to increase granularity of information according
to the real needs for policy making. Based on experiences implementing the Framework in pilot countries, it is recommended that countries:

- identify and agree on a specific list of priority data demands with government planners and decision makers
- improve granularity of climate change data to ensure it is fit for purpose for policy making
- leverage data communication strategies to increase data use for climate action.

Ensure climate change data financing

As is the case with other areas of statistical production, an important challenge for national statistics systems is securing sustainable financing for data and statistics. CCDE actors face constrained human and financial resources, and many agencies lack dedicated funding for data collection, analysis and communication. There is a need to mainstream data in planning processes such as the national development plan (NDPs) and sectoral development strategies and integrate climate change in statistical planning such as national strategies for the development of statistics (NSDS) to ensure enough resources are available for quality climate change data. These efforts will highlight the need for climate change data and provide a clear mandate to support statistical production. Besides advocating for funding, it is important that CCDE actors prioritise the scope of their work according to their means and capacity, planning for a scale-up in the future. CCDE plans and activities should be feasible to implement and be adapted to the context of the country where they operate, particularly in lower-income countries. Based on experiences implementing the Framework in pilot countries, it is recommended that countries:

- integrate climate change data in national policies and programmes such as NDPs and the NSDS
- advocate for climate change data financing from domestic and international funding, including by positioning climate change statistics as a key to unlocking climate financing
- prioritise data demand, CCDE stakeholders and activities in a participatory manner.
Part 2

Step by step guide to implementing a climate change data ecosystem
Step 1 – Prioritising climate change data demand

In Brief

What to expect from Step 1

Objective and expected results

The aim of Step 1 is to facilitate the identification of priority climate change data demands in the data ecosystem by (1) mapping data needs from national or sectoral climate change plans and international agendas and (2) selecting a core set of priority indicators related to climate change.

Proposed method

Inventory national and international climate change data demands, through desk research and bilateral consultations with key stakeholders from the NSS and the data ecosystem. These consultations will allow the prioritisation of identified indicators and help stakeholders agree on a core set of needed climate change indicators.

Targeted audience

The intended audience is stakeholders from the NSS including the statistics unit at the Ministry of Environment (MoEnv) or analogous institution, the climate change office, and the environment unit or equivalent of the statistics office in consultation with other line ministries and government agencies working on climate change.

Relevant tools from the Framework toolbox

Tool 1 – Data gaps Excel template (ADAPT)
What is climate change data demand?

In the Framework, data demand refers to the indicators needed to monitor development targets in relation to climate change plans and policies. National climate change data demands stem from two main sources: (1) national climate change plans and policies linked to climate and environmental issues and (2) international reporting requirements.

At the country level, demand for climate change data derives from the need to tackle countries’ exposure and vulnerability to climate change-related impacts and from perceptions across different layers of society of these risks and of the urgency for action to adapt and build resilience. Countries can identify national climate change data demands in their national development plans (NDPs), national mitigation commitments embedded in the nationally determined contributions (NDCs), national adaptation plans (NAPs), and other existing or planned sectoral climate change-related policies, strategies and plans pertaining to agriculture, energy, disaster risk reduction, natural resources, biodiversity, and water use and management, among others.

In terms of international reporting, countries often adopt global agendas whereby they commit to providing information on progress and on their pledges to address climate change through adaptation and mitigation actions. These commitments are defined in multilateral environmental agreements such as the Paris Agreement (2015) under the UNFCCC and the Sendai Framework for Disaster Risk Reduction 2015-30. Countries also make commitments to report through other global and regional agendas including the 2030 Agenda for Sustainable Development.

Many countries struggle to identify a clear demand for climate change statistics and indicators. Even where demand has been established, sometimes monitoring and evaluation (M&E) frameworks are missing or they do not identify measurable impact indicators to track progress. The box below highlights the differences between process and impact indicators and how they are relevant to the CCDE Framework.

**Box 3. Process and impact indicators**

There are different types of indicators in development plans. A simplified way of categorising them is to look at what they measure. Impact indicators are those indicators that help measure progress towards development targets (for example, the number of people displaced due to the effects of natural disasters). Process indicators are designed to follow up on planned activities and do not provide information on the actual phenomena (for example, number of campaigns undertaken around disaster management). When mapping data demand and identifying data gaps, both types of demands can be mapped. However, it is important to note that process indicators are usually available from administrative records while the most pressing gaps could relate to monitoring impact indicators. Impact indicators are at the core of the CCDE Framework because the information they provide is key to informed climate action.

Mapping data demand is crucial to developing a tangible list of data that should be produced, clarifying what data are needed and for what objective. PARIS21 suggests linking the data demand to policy making to help mobilise data for climate action. Prioritising climate change data demands allows countries to focus resources on the most pressing issues and find ways to maximise data availability within current constraints in the statistical system.

By mapping data demand, data producers also are able to identify a core list of climate change-related indicators such as those that respond to various development agendas at the global, regional and national level as well as those aligned with the Sustainable Development Goals (SDGs), the Paris Agreement and...
MOBILISING CLIMATE CHANGE DATA ECOSYSTEMS FRAMEWORK

the Sendai Framework, among others. Mapping also enables data producers to prioritise data production according to national priorities, statistical capacities and funding.

**How to prioritise climate change data demands**

Priority climate change indicators that respond to national demands for policy action and global reporting will be identified through desk research and bilateral consultations with planners and policy makers at the MoEnv (or analogous), NSO, and key ministries linked to environment and climate with a view to obtain more granular information about the country’s priority data needs. The process to prioritise demand will help form consensus on what data are priority for statistical production and will help align the data supply to data demand, making data providers more user centric.

A suggested template to facilitate the identification and prioritisation process is provided under Tool 1. ¹

This process involves:

1. **Mapping national, sectoral and global plans, policies, and strategies relevant to climate change.**
   Given the multi-dimensional nature of climate change, it is likely that national climate change data demands need to be tracked back across multiple sectoral plans and strategies climate-specific plans and strategies (if these exist). Examples of relevant climate change plans include NDPs, NAPs, NDCs, and agricultural, health and food security plans.

2. **Compiling and analysing the monitoring frameworks of the selected plans, strategies and policies.**
   This includes identifying M&E frameworks and the indicators they contain to track progress towards development targets. When the plans do not have impact indicators attached, countries can use the UNSD Global Set to identify indicators that could be useful to monitor the selected plans.

3. **Prioritising the data demand to identify a core set of priority indicators.**
   Given the capacity and resource constraints countries face in producing climate change data, there is a need to identify and agree on a core set of indicators at the national level that will be prioritised for regular production. Prioritisation of the demand should be done in consultation with statisticians, planners and decision makers of the ministries involved in climate change, including the statistics office and MoEnv.

Step 1 of the PARIS21 Mobilising CCDEs Framework process will help countries, especially small and low-income countries with scarce resources for statistics production, to identify a core list of prioritised indicators that are agreed on by key planners and policy makers. Developing this core set enables a more strategic approach to resource mobilisation and capacity development actions based on the priority areas identified and validated by national focal points.

**Note**

¹ If a country is interested and has the capacity, the systematisation of information can be done in the online Advanced Data Planning Tool (ADAPT) developed by PARIS21. ADAPT helps stakeholders conduct a data gaps assessment, starting with the mapping of data demand from public policies. Annex C provides more details.
Step 2 – Assessing climate change data and statistical capacity

In Brief

What to expect from Step 2

Objective and expected results

Once the core data demand is identified in Step 1, the second step of the Framework aims to assess (1) the extent to which current data production responds to this demand and (2) the statistics system’s strengths and weaknesses to produce the data needed for climate change monitoring and reporting. The assessment will contribute to developing a plan to improve data availability and statistical capacity in the future.

Proposed method

Step 2 calls for development of a comprehensive and validated report around current data availability and capacity related to climate change data production, dissemination and use. The assessment will be conducted through a data template and targeted questionnaires sent to key stakeholders of the CCDE (e.g., the NSO, MoEnv, other line ministries and non-state actors). Follow-up consultations will be held to discuss, validate and agree on the most critical data and capacity gaps identified.

Targeted audience

The intended audience is NSS actors, including line ministries and government agencies relevant to climate change, and relevant non-state actors such as the private sector, civil society, academia and research institutions.

Relevant tools from the Framework toolbox

Tool 1 – Data gaps Excel template (ADAPT)
Tool 2 – Capacity questionnaires for MoEnv, NSO, state and non-state actors
Tool 3 – Results matrix to organise results of the capacity questionnaires
Climate change-related data

What is the purpose of an assessment of climate change-related data?

Assessing national climate change data will help identify gaps between existing demand for climate change data (set of core indicators from Step 1) and the supply of climate change data. This will also show the extent to which the indicators required to monitor key development agendas related to climate change are being produced according to what is needed (in terms of geographic coverage, frequency of data production, and disaggregation variables available). The result of the assessment will be a comprehensive overview of the country’s climate change data sources, prevailing data gaps and key data producers that can improve the alignment of data supply and climate change data demands.

How to assess climate change-related data

The data assessment is a comparison between what the development frameworks require (identified in Step 1) and what the NSS produces. The assessment will be done indicator by indicator, covering all the indicators identified as the core demand.

Tool 1 of the toolbox includes a suggested template to support the data gaps assessment – the data gaps Excel template (ADAPT) that can be found in Annex C. This assessment provides a holistic overview covering the following dimensions:

- availability of the indicator
- availability of data to produce missing indicators
- level of disaggregation of the information according to what is requested in the M&E policy framework (e.g., sex disaggregation, age, income status)
- frequency of data collection and timeliness
- geographic coverage of the indicator (national, subnational, urban or rural).

Information for the data gaps assessment will be obtained through desk research, consultations with key data producers and the use of targeted questionnaires sent to key stakeholders (NSO, MoEnv, other line ministries and non-state actors). The questionnaires are provided in Annex A CCDE Framework Toolbox.

Statistical capacity linked to climate change data

What is statistical capacity?

Assessing statistical capacity refers to identifying capabilities that must be developed or strengthened within the NSS to ensure that the core set of climate change indicators (identified in Step 1) is regularly available, well disseminated and effectively used to advance climate action.

The PARIS21 Capacity Development 4.0 Matrix Framework proposes a way to navigate the capacity assessment process. The Framework proposes a multi-level approach (i.e., by individual, organisation, system) across five critical areas of statistical capacity: resources, skills and knowledge, management, politics and power, and incentives. These are shown in Table 1.
Table 1. Examples of specific capabilities for better and more climate data for action

<table>
<thead>
<tr>
<th>Capacity area or level</th>
<th>Individual</th>
<th>Organisational</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>Staff with qualifications in statistics and a field relevant to climate change such as agriculture, biodiversity, energy, adaptation, water, disaster management, etc.</td>
<td>Number of employees and budget dedicated to the production, management, and dissemination of climate change data; software for data management collected from water-level radar sensors and solar panels</td>
<td>Monitoring frameworks of climate change strategies (adaption and mitigation); manuals or codes for production and sharing of climate change data, including those from alternative data sources</td>
</tr>
<tr>
<td>Skills and knowledge</td>
<td>Technical skills on remote sensing data collection, image analysis and geographic information systems proficiency</td>
<td>Use of international standards and guidelines for climate change statistics (e.g., Framework for the Development of Environment Statistics, Global Set)</td>
<td>Knowledge-sharing space for stakeholders involved in the use and production of climate change data (e.g., webinars, seminars, expert meetings, etc.)</td>
</tr>
<tr>
<td>Management</td>
<td>Time that climate change data personnel dedicate to other areas</td>
<td>Climate change data strategy is in place and aligned to other strategic national plans and strategies</td>
<td>A committee and/or task force with a focus on climate change data; data-sharing agreements for climate change data</td>
</tr>
<tr>
<td>Politics and power</td>
<td>Attendance at climate change statistics-related professional meetings, workshops and/or training events</td>
<td>Data sets relevant to climate change and their metadata are available to the public</td>
<td>Regular meetings and events where users and producers of climate change data have opportunities for exchange</td>
</tr>
<tr>
<td>Incentives</td>
<td>Career opportunities within the CCDE</td>
<td>Approach to adapt to users’ needs and demands for data on adaptation and mitigation</td>
<td>National climate change issues are present in the political debate and agenda</td>
</tr>
</tbody>
</table>

Source: Authors based PARIS21 (2020)11, Capacity Development 4.0 Matrix. Link here

Mapping capabilities linked to the five areas and three levels proposed by the PARIS21 Capacity Development 4.0 Matrix Framework offers a holistic view of the capacity of the NSS to produce, disseminate and use data. Using this framework in the context of climate change data will help environment ministries, NSOs and climate change partners map and describe the granular capabilities and resources needed to develop the national CCDE as well as the strengths of the NSS that can be built on in the future.

**How to identify climate change-related statistical capacity**

The assessment aims to gather information from key stakeholders on the state of play of the national CCDE. It will be conducted using three targeted questionnaires, one to be sent to focal points in the MoEnv and NSO and the others to focal points in other line ministries and non-state actors relevant to climate change. Table 2.2 is an overview of the content of the questionnaires. Tool 2 of the toolbox provides the complete questionnaires. The implementing agency of the questionnaire should ensure that they are adapted to national realities and priorities.
Table 2. Tool 2: Overview of questionnaires for statistical capacity assessment

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Target audience</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| **Questionnaire A** – Module for climate change data focal points in the NSO and MoEnv | In the NSO: statistical focal point working with climate change and/or environment statistics. In the MoEnv climate change unit (or analogous): statistical focal point working with climate change and environment statistics (if applicable) and technical focal point working on climate change-related topics and involved in the reporting processes to national and international commitments on climate change | To gather information on:  
  - the legislative framework  
  - the demand and co-ordination landscape related to climate-related statistics in the country  
  - capacity needs at the individual, organisational and system levels to better produce, disseminate and use climate change in the NSS and beyond  
  To identify main data users, other producers and strategic stakeholders within the NSS and beyond. |
| **Questionnaire B** – Module for line ministries relevant to climate change-related statistics and data | In line ministries relevant to climate change-related data: technical focal point working on data and/or reporting processes to national and international commitments | To gather information on:  
  - the availability of data relevant to climate change  
  - data needs and priority areas  
  - the main capacity needed to produce, disseminate and use data  
  - critical non-state actors and their potential roles in building a stronger CCDE |
| **Questionnaire C** – Module for non-state actors relevant to climate change-related statistics and data | Non-state actors relevant to climate change-related statistics and data: focal points working activities related to climate change from civil society organisations (CSOs), the private sector, academia, research institutes, media, etc. | To gather information on:  
  - the climate change-related data interest, needs and priorities of different non-state actors  
  - the satisfaction level with available data  
  - main capacity challenges to using data and how these actors can contribute to building a more robust national CCDE  
  - other key non-state actors and their potential roles in building a stronger CCDE |

The responses to the questionnaires can be recorded into a matrix (Tool 3 of the toolbox) to help analyse the results. This will help organise information collected and keep track of replies. A final report analysing the results should be developed and become the basis of the planning for improvements of the CCDE. Annex B provides a template for the assessment.

In addition to the questionnaires, bilateral consultations or workshops are key to complement and validate the information gleaned from the responses. Face-to-face interactions can facilitate the process of identifying and also agreeing on the greatest strengths of the NSS and the most critical capacity gaps. Box 4 showcases an example of how assessing statistical capacity and data gaps can be beneficial for countries to strengthen national capabilities for climate reporting.
### Box 4. Assessing environmental data in Lao PDR to unlock climate financing

**Unlocking climate financing through strengthened environment statistics**

PARIS21 is supporting Lao PDR’s Statistics Bureau and line ministries in assessing the capacities and data needed to unlock climate and green financing for the country. Using the Mobilising CCDEs Framework and tools, PARIS21 has assessed the capacities and data gaps to strengthen environment statistics, which are crucial to facilitate adoption of various green financing modalities.

The assessment was conducted under the framework of the Multi-dimensional Review process led by the Development Centre of the OECD in collaboration with the government of Lao PDR. Building on the results from the assessment, PARIS21 and the Statistics Bureau are exploring avenues to strengthen capacities of the national CCDE.

### Notes

1. The template provided in this framework is fully compatible with the PARIS21 Advanced Data Planning Tool (ADAPT). Information collected in the template can be uploaded onto ADAPT, or ADAPT can be used directly to conduct the data gap assessment.

Step 3 – Engaging key actors of the CCDE

In Brief
What to expect from Step 3

Objective and expected results
Building on the initial contact with strategic stakeholders in Steps 1 and 2, Step 3 aims to map and discuss how these actors can contribute to a coherent and responsive CCDE. In addition to an agreement on their potential roles, the expected result is a visualisation of the most relevant data actors, including state and non-state organisations, as well as the enabling environment they work in and the data systems they have put in place.

Proposed method
The information from the results matrix of the questionnaires (Step 2) and consultations with CCDE actors will be used to map and/or list the most relevant stakeholders of the CCDE (both the NSS and non-state actors) and the data systems currently in place, and to understand the enabling environment for climate change data production and use.

Targeted audience
The intended audience is NSS actors, including line ministries and government agencies relevant to climate change, and key non-state actors such as the private sector, civil society, academia, and development partners.

Relevant tools from the Framework toolbox
Tool 3 – Results matrix to organise results of the capacity questionnaires
Tool 4 – CCDE mapping tool
What does it mean to engage key actors of the CCDE?

Engaging strategic stakeholders within the NSS and beyond involves consulting key actors in the CCDE, identifying the data systems they have put in place, and understanding the environment they work in. The aim of Step 3 is to map this data ecosystem and help data actors identify potential roles for engagement among and across stakeholders of the CCDE. Engaging the larger CCDE community can help maximise resources and technical capacity to improve the production, dissemination and use of climate change-related data in a resource-constrained environment.

Identifying actors beyond the NSS may be challenging as most of the time, no clear roles are defined for such actors in statistical production. However, there is enormous potential for these non-state actors to help close data and capacity gaps through their collaboration with traditional data actors such as environment ministries and statistics offices. Table 3 provides some examples of successful collaborations that have proved beneficial to climate change data production and use.

### Table 3. Country examples of potential roles for state and non-state data actors engaged in the CCDE

<table>
<thead>
<tr>
<th>Potential roles of CCDE actors across the data value chain</th>
<th>Collection</th>
<th>Publication</th>
<th>Uptake</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National statistical system actors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSO (environment and/or climate statistics unit)</td>
<td>Indonesia – National Oceanography Data Center</td>
<td>Grenada – Compendium on Environmental Statistics 2020</td>
<td>Tanzania – Climate Change Statistics Committee</td>
<td>Papua New Guinea – data literacy training for government officials</td>
</tr>
<tr>
<td>MoEnv (climate statistics unit, focal point to UNFCCC, development planning unit)</td>
<td>Philippines – National Integrated Climate Change Database and Information Exchange System</td>
<td>Antigua and Barbuda – National Environmental Data and Information System (NEIS) and Natural Resources Inventory (NRI)</td>
<td>Iraq – Ministry of Environment’s demand for climate data</td>
<td>Vanuatu – Strategic Roadmap for Emergency Management (SREM)</td>
</tr>
<tr>
<td>NSS agencies (e.g., ministries’ technical experts; special agencies on meteorological, water and disaster risk)</td>
<td>Senegal – Ministry of Environment and Sustainable Development prioritisation of climate data in policy creation</td>
<td>India – India Water Resources Information System (India-WRIS)</td>
<td>Multiple examples with the Coalition of Finance Ministers for Climate Action</td>
<td>Grenada – Disaster Resilience Strategy, prepared jointly by the Ministry of Finance and Ministry of Climate Resilience of Grenada</td>
</tr>
<tr>
<td>Policy makers</td>
<td>Belize’s national policy to integrate climate change into development goals</td>
<td>Ecuador’s National Climate Change Mitigation Plan use of data to track progress on reducing greenhouse gas emissions</td>
<td>Grenada’s prime minister’s push for climate change to have as urgent a response as that to COVID-19</td>
<td>Barbados – Prime Minister Mottley leads the charge against climate change</td>
</tr>
</tbody>
</table>
### Non-state actors

<table>
<thead>
<tr>
<th>Collection</th>
<th>Publication</th>
<th>Uptake</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CSOs (e.g., focal points for umbrella organisations, NGOs, local and regional initiatives)</strong></td>
<td>Philippines – citizen-generated data for SDGs reporting</td>
<td>Rwanda – data training for data providers, data producers, data users, research institutions and academia, private sector, civil society, national and international NGOs, individuals</td>
<td>Iraq – workshop on impacts of climate change on women and girls for governments, the private sector, CSOs, and youth activists</td>
</tr>
<tr>
<td><strong>Private sector (e.g., chamber of commerce, telecom company)</strong></td>
<td>Blue Sky Analytics translates satellite data into climate data</td>
<td>Egypt – data training for the private sector</td>
<td>Malaysia – stock exchange of Malaysia produces reports on sustainability progress</td>
</tr>
<tr>
<td><strong>Academia (researchers, representatives of liaison unit)</strong></td>
<td>Columbia University (US) Earth Institute using GIS data to support climate policy</td>
<td>University of the Virgin Islands Caribbean Green Technology Center promotes the use of green technologies to achieve resilience and sustainability goals</td>
<td>Université Cheikh Anta Diop de Dakar -- research programme on climate change and economics</td>
</tr>
<tr>
<td><strong>Media (unit specialised in climate change)</strong></td>
<td>Tanzania – Climate Action Network shares updates on climate change and sustainable development</td>
<td>Pacific region – Pacific Environment Journalists Network (PEJN)</td>
<td>UNESCO handbook for journalists: Getting the message across: Reporting on climate change and sustainable development in Asia and the Pacific</td>
</tr>
</tbody>
</table>

*Source: Authors’ compilation.*

### How to identify and prioritise state and non-state actors of the CCDE

Engaging stakeholders of the CCDE is a continuous process throughout implementation of the Framework, starting with Step 1. In Step 3, the aim is to intentionally create partnerships and identify the actors that will be implementing the action plan to mobilise the CCDE (Step 4). This involves using the completed results matrix (Tool 3 of the toolbox) from Step 2 and reaching out to key partners to map stakeholders, data and the enabling environment of the CCDE (Tool 4 of the toolbox).

The mapping tool (Tool 4 of the toolbox) provides guidance to help identify the core elements of the CCDE. Prioritising actors of the CCDE is crucial in low-capacity contexts where it might not be possible to engage the whole CCDE due to constrained human resources and capacity. By prioritising the CCDE actors, a more targeted and feasible approach to improving climate change data will be possible.
The mapping of the CCDE covers the following elements:

- Enabling environment including the legislative frameworks and co-ordination mechanisms in place for a CCDE to operate
- Demand for and supply of climate change data, capturing key elements driving climate change data demand and supply in the country
- CCDE stakeholders, identifying data users and producers within the NSS and the data ecosystem such as academia, civil society, the private sector and other non-state actors.

The outcome of Step 3 is a validated mapping of the most strategic actors of the CCDE and their commitment to support its improvement. This prioritised group of stakeholders will participate in the identification of concrete activities to improve climate change-related data during Step 4 of the Framework.

Figure 9 illustrates what such a CCDE mapping might look like.

**Figure 9. Generic example of a CCDE ecosystem**

---

**Climate Change Data Ecosystem**

**Enabling environment**
- Legislative frameworks
  - Examples:
    - Climate change legislation
    - Statistical act
    - Data sharing protocols
    - Environmental act
- Co-ordination mechanisms
  - Examples:
    - Climate change committee
    - Environmental statistical advisory committee

**Data demand and supply**
- Plans and commitments
  - Examples:
    - 2030 Agenda
    - Nationally determined contributors
    - National adaptation plan
    - National development plan
- Data systems and portals
  - Examples:
    - Monitoring, reporting and verification system
    - Meteorological portal
- Data products
  - Examples:
    - Environmental report
    - Environmental statistical compendia
    - Climate change report
    - Energy balance report
    - Disaster admin data

**Data users and producers**
- State actors
  - Examples:
    - National statistics office
    - Ministry of Agriculture
    - Ministry of Environment
    - Ministry of Planning
    - Ministry of Energy
- Non-state actors
  - Examples:
    - Universities
    - Farmers associations
    - Private sector
    - Research institutes
    - Development partners
    - Non-govt organisations
**Raising awareness of the importance of data for effective climate action**

Recognising that data are key enablers of effective climate action is crucial for mobilising stakeholders and resources. It is therefore important that CCDE engagement take place in the context of national planning mechanisms and with the support of climate change actors that can help advocate for impactful data, particularly in contexts where demand for climate change data remains low.

There are a number of avenues to drive home the message of the importance of climate change data. Most national development plans include goals and targets or a dedicated section to climate change, showing the government’s commitment to designing, implementing and monitoring actions to adapt and mitigate the effects of climate change. Having the right data can be mainstreamed as a goal and key element of these efforts.

Governments can have additional specific policies, beyond the NDP, to address climate change – for instance, a climate change strategy, adaptation policy or a climate change mitigation plan. Implementation and monitoring of these policies and plans also rely on quality data, which makes them a powerful mechanism for raising awareness of the importance of data for effective climate policy making.

If climate change is not yet reflected as a priority in national plans, harnessing the country’s international commitments to the Paris Agreement is a way to bring awareness to the role of data. Paragraph 2 of Article 4 of the Paris Agreement requires each Party to prepare, communicate and maintain successive NDCs that it intends to achieve.¹ NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. As of 2024, each Party must submit a biennial transparency report (BTR) to the UNFCCC secretariat every two years. Through the BTR, countries will provide information on tracking progress towards achieving their NDC targets. Quality and timely climate change data are crucial for developing BTRs. This type of international commitment and the partners leading the agenda, such as the UNFCCC, can help advocate for climate change data.

**Notes**

¹ For more detail on the Paris Agreement and NDCs, see [https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs](https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs).
Step 4 – Strategic planning for an improved CCDE

In Brief

What to expect from Step 4

Objective and expected results

Step 4 builds on results from the CCDE assessment and mapping of key CCDE stakeholders (Steps 2 and 3) with the aim of identifying the principal objectives, concrete activities and estimated costs to make climate change data available and usable for policy action. The expected output is an action plan to mobilise the national CCDE that is anchored in national planning mechanisms such as NDPs, climate change adaptation and/or mitigation plans, or a national strategy for the development of statistics (NSDS).

Proposed method

Step 4 involves developing a strategic framework for climate change data in the country and identifying a detailed costed action plan to mobilise state and non-state actors to produce and use more and better climate-related statistics. The planning process should ensure a participatory approach to help identify synergies and maximise resources.

Targeted audience

The intended audience is the MoEnv or national agency in charge of climate change, the NSO, NSS stakeholders, and key non-state actors.

Relevant tools from the Framework toolbox

Tool 1 – Data gaps Excel template (ADAPT)
Tool 3 – Results matrix to organise results of the capacity questionnaires
Tool 4 – CCDE mapping tool
Tool 5 – Strategic action plan template (Word document and Excel sheet).
What does strategic planning for the CCDE entail?

A strategic plan to mobilise the national CCDE helps identify common objectives, concrete activities and estimated costs to make climate change data available and usable for effective action by policy makers and a broad group of users.

Formulating and implementing an action plan to mobilise the CCDE will help guarantee the sustainable and long-lasting production and use of climate change data in the country to inform decision-making processes and support international reporting requirements. The strategic plan helps identify feasible solutions to tackle data needs and provides a framework to track progress towards improving climate change data production and use. One of the most used tools for strategic planning in statistics is the National Strategy for the Development of Statistics (NSDS). The NSDS is developed in many countries and can anchor the CCDE action plan as explained in Box 5.

**Box 5. Strategic planning for statistics: The NSDS**

The NSDS is a planning approach to develop capacity to produce, disseminate and mainstream the use of statistics. Anchoring the CCDE strategic plan in an existing statistical planning agenda helps ensure the necessary resources for implementing the CCDE action plan and also promotes collaboration among institutions and alignment with other national priorities.

Given the complexity and broad scope of climate change data, aligning the CCDE action plan to an NSDS can facilitate collaboration across different sectors and ensure high-level support. When the country has an NSDS, the CCDE action plan should align to its goals and implementation plan. The CCDE action plan, in this situation, can be included as a sectoral statistics plan of the NSDS.

**How to make a strategic plan for the CCDE**

*Envisioning the future of the CCDE*

The strategic framework of a data action plan sets the targets for the development of climate change statistics in the medium to long term (five to ten years). It is an agreement across the CCDE on the most important priorities for climate change data that all stakeholders commit to support. The information gained from the data demands and gap assessments will provide a foundation for designing actions to address data and capacity gaps while meeting the data demands.

A consultative, multi-stakeholder approach should be used to develop the strategic framework (Tool 5 of the toolbox) of the data action plan to ensure buy-in from state and non-state actors. This section of the CCDE action plan will contain a vision, mission, objective, outcomes and values for the data ecosystem, all aligned to the NDP and other national policies related to climate change. The following are elements of a strategic framework.

**Vision.** A vision statement should summarise the ultimate goal of the CCDE for the medium term that the action plan aims to achieve. The vision represents the overall solution to the key problems linked to the availability and usability of climate change data identified during the assessment.

**Mission:** The mission statement represents the expression of the collective organisational mandate and functions of the CCDE toward achieving the vision. The mission states how the vision will be achieved, making a more operational statement than the vision.
Core values (optional): The core values are the relevant, shared fundamental principles and ethical standards that guide and govern the functioning of the CCDE. They can cover management practices, organisational development and communication, policies and standards, business processes, and user relations in the NSS. The core values should be consistent with existing relevant global frameworks such as the UN Fundamental Principles of Official Statistics 1.

Strategic goals: The vision and mission can only provide a general summary of the strategic directions of the CCDE in the medium term and must be broken down into four to six more tangible, time-bound and measurable goals. These strategic goals must be prioritised based on both the priority indicators for national development goals and available capacity and resources for the production and use of climate change data. Keeping the number of strategic goals to four to six will prevent the implementation and monitoring of the plan from becoming overly complex.

Expected strategies and outcomes: The expected outcomes help the CCDE identify a coherent objective tree or theory of change that transforms the high-level vision, mission and strategic goals into tangible targets. Each strategic goal should have at least two expected strategies and/or outcomes that will serve as the basis for CCDE actors to identify salient actions and output they can implement to support the CCDE vision.

Governance and monitoring of the CCDE action plan: This element of the strategic framework should describe how the CCDE action plan will be endorsed, monitored and evaluated and include all bodies that will govern the action plan such as a high-level advisory committee, technical committee, working groups, etc.

Risk assessment and mitigation strategies: These set forth potential obstacles to achieving the goals envisioned for the CCDE and each of the strategic goals alongside mitigation strategies that could be used to increase the probability of achieving the goals and outcomes in the action plan.

Developing the CCDE action plan

Once the objectives and outcomes of the CCDE are decided, it is time to define how these high-level aims are to be achieved. The action plan (see Tool 5 of the Toolbox) is a detailed roadmap to achieving the objectives envisioned for the CCDE, including defining the responsible institutions, timelines and funding needed. This part of the process will specify what will be done and by whom and when. Results of the mapping exercise (derived from the CCDE mapping tool) will help identify the stakeholders (state and non-state) that will contribute to developing and implementing the action plan. The following are key elements of the plan illustrated in Table 4.

Activities: Activities related to data production, dissemination or use that data actors are implementing or planning in the medium term that will support the outcomes of the CCDE. Aligning the activities of the CCDE with other sectoral plans can facilitate the engagement of critical national agencies and actors to implement the action plan for climate change data.

Outputs: Each of these data-related activities should have at least one output – that is, a tangible result obtained from that activity – that can be monitored and verified when implementing the action plan.

Performance indicators (including target and baseline indicators): These indicators will help monitor the achievement of the CCDE action plan at regular intervals. The action plan should clearly state how the success of any activity will be measured as well as the starting point of the activity (baseline being current achievement) and the expected results by the end of implementation of the activity (target being foreseen achievement).

Responsible institution: The ministry, department or agency in charge of the activities identified that will be leading the implementation of the specific activity should be listed. Where the data-related activity is...
conducted as an inter-institutional collaboration, the action plan should clearly name the institutions involved to ease inter-institutional co-ordination.

**Time-line:** All activities should be time bound, and the action plan should state when the activities are expected to take place and how many times they will be implemented within the time-frame of the strategy. Depending on the length of the action plan, the timelines could be spread over years, quarters or months.

**Costs:** All listed activities must include estimates of the resources needed to implement them, including the cost for consultancy services, new infrastructure and technologies, and particular outputs. Costing the activities of the plan will provide an estimated budget for implementing it. Clear costs will facilitate the identification of potential funding sources from domestic budgets and technical and financial international development assistance.

**Table 4. Example of a CCDE action plan**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Activities</th>
<th>Output</th>
<th>Performance Indicators</th>
<th>Target</th>
<th>Baseline</th>
<th>Responsible institution</th>
<th>Cost of activity</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Example)</td>
<td>1.1 Strengthen admin records related to climate change statistics</td>
<td>1.1.1 Develop metadata for admin records</td>
<td>Metadata Files by record</td>
<td>Number of metadata files</td>
<td>20</td>
<td>5</td>
<td>NSO, NSS</td>
<td>3000</td>
</tr>
<tr>
<td>Total Cost</td>
<td>12000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.

**Fundraising for the implementation of the plan**

The success of the CCDE action plan implementation greatly depends on the funding and resources mobilised for it. To ensure efficient fundraising, it is important to make a realistic costing of all activities in the plan. Once the plan is costed at the activity level, it is possible to estimate a holistic budget, including financial and technical resources needed.

The fully costed action plan will allow CCDE actors to engage with funding partners and tap into domestic budgets and development assistance such as climate financing flows. The CCDE action plan represents agreed-upon goals that increase the return on investment by maximising effective use of resources, avoiding duplication and benefitting the whole data ecosystem. Additionally, the CCDE action plan proposes a detailed implementation and monitoring plan, providing a solid foundation for impact measurement.

Strategies to mobilise more resources for climate change-related data and the implementation of the action plan include:

- **Costing all activities of the CCDE action plan in a thorough and realistic manner.** Every activity should have a cost associated with it, including those activities that already have financing sources to establish a real estimate of the cost of full implementation and to show existing investments towards climate change data that might generate additional financial support.
• **Developing a financing strategy to implement the plan.** It is important to establish the essential steps and actors that can help the CCDE access adequate financial resources for activities. These include identifying sources of funds, matching needs and availability of support, and determining a roadmap for fundraising activities.

• **Linking the action plan for climate change data to an existing planning agenda relevant to climate change** (e.g., the NSDS, NDP, NAP). This will help mobilise the resources for implementing the action plan as part of the umbrella plan. Further, it could help strengthen the M&E process of the action plan by integrating it into existing M&E processes.

• **Engaging with national stakeholders first.** Utilising government resources can create stronger ownership in achieving the plan while also optimising development co-operation assistance. The Ministry of Finance (or analogous entity) should be closely involved in developing and validating the financing strategy of the CCDE action plan.

The CCDE data action plan offers immense potential to help narrow the financing gap for climate change data at the country level and provides national and international funders with a roadmap on priority national needs for effective investments in statistics.

**Governance and monitoring of the CCDE action plan**

A clear governance set-up and monitoring protocols ensure smooth implementation of the CCDE action plan. The monitoring plan should clearly delineate how and who will validate the action plan and how the progress on implementation of the activities will be tracked.

Key strategies to define an accountability framework for the CCDE action plan include:

• **Identifying a steering committee in addition to the technical working group.** While technical counterparts will primarily develop the plan, it is important that a higher-level committee supervises and monitors the CCDE plan. This committee will validate the plan, receive progress reports, and validate updates or modifications to the activities.

• **Validating the CCDE assessment and action plan at each stage of development.** The different outputs of the process should be reviewed in consultation with the technical counterparts developing the plan and with high-level decision makers of the institutions involved.

• **Looking for endorsement of the action plan at the highest level, preferably by the cabinet.** The final action plan should be presented for adoption and endorsement by decision makers from the different institutions involved in its implementation and funding. A high-level official launch of the plan can help cement commitment and mobilise resources.

• **Preparing an overall monitoring plan based on the performance indicators and targets of the activities.** The monitoring section should detail the results, activities and time-line of reporting. It is also useful to develop appropriate reporting guidelines, templates and mechanisms for M&E and to set regular milestones for CCDE actors to generate implementation reports.

Well-designed monitoring activities produce information that can signal potential problems, address challenges and identify alternative solutions. M&E milestones should be viewed as opportunities to course-correct the activities and targets of the CCDE action plan. They will underpin a flexible action plan that is easily adapted when emerging issues arise, priorities change or external shocks make it impossible to achieve the activities initially planned. Monitoring reports are also an excellent way of recording the successes of the CCDE and advocating for increased political and financial support.

As seen in Box 6 another way to promote effective monitoring of the activities and targets produced in a CCDE action plan is to mainstream climate change into the national strategic planning for statistics.
Box 6. Mainstreaming climate change in strategic planning for statistics

How select countries are mainstreaming climate change statistics in data planning

In 2023, PARIS21 supported the NSOs from Belize, Grenada and Senegal to develop their national strategies for the development of statistics, which include a specific climate change and environment statistics component. Under the leadership of the statistics offices in these countries and in close collaboration with the countries’ ministries of environment, an action plan for environment and climate change statistics is being developed.

Mainstreaming climate change statistics into data planning can help increase the visibility of statistics. Mainstreaming climate change statistics into strategic data planning can also open a path to greater political support. The Senegal NSO, for instance, plans to submit its NSDS, which includes an action plan for climate change data, to the government for endorsement. This process will help direct the existing political will on climate change to the data and statistics arena to build a strong CCDE capable of responding to the changing data demands for climate action.

The climate change action plan as a mechanism to improve co-ordination

In the case of Grenada, the Central Statistics Office plans to use its environment and climate change action plan to mobilise its recently established Environment Statistics Advisory Committee. The Committee is expected to provide guidance on the use of environment and climate change statistics and advise on emerging national priorities.

A model for collaboration between NSOs and ministries of environment

In Belize, the Statistical Institute of Belize (SIB) and the National Climate Change Office have identified synergies to improve the dissemination of climate change data, leveraging SIB’s existing digital infrastructure and expertise.

Note

1 Available at https://unstats.un.org/unsd/dnss/hb/E-fundamental%20principles_A4-WEB.pdf.
References


Annex A. CCDE Framework toolbox

Tool 1. Data gaps Excel template (ADAPT)
Click here for the template

Tool 2. Capacity questionnaires for MoEnv, NSO, state and non-state actors
Click here for the questionnaires

Tool 3. Results matrix to organise results of the capacity questionnaires
Click here for the Results Matrix template

Tool 4. CCDE mapping tool
Click here the CCDE mapping tool CCDE Mapping Tool_Final.pptx

Tool 5. Strategic action plan template
Click here for action plan
Annex B. Assessment report template

Climate change data ecosystem assessment report template

1. Introduction: Objective of the assessment, scope and a general explanation of why the assessment has been conducted at that specific time

2. The national climate change data ecosystem (CCDE): i.e., definition of the national CCDE in terms of the (a) legal and policy framework, (b) data demand and supply, and (c) data users and producers and their (potential) roles in building a stronger CCDE; SWOT (strengths, weaknesses, opportunities and threats) analysis results can be included here if available

3. Main results of the CCDE capacity assessment per thematic area: i.e., diagnosis of current capacity and climate change data availability
   a. main policies and plans driving demand for climate change data
   b. co-ordination (existing mechanisms and practices and opportunity areas for improvement)
   c. data production (existing principal sources, main characteristics related to production of quality statistics and areas for improvement)
   d. data sharing, dissemination and use (data-sharing and dissemination practices, how are climate change data used, and identified areas to improve user-producer relationships)
   e. resources, skills and knowledge (major needs in terms of resources, expertise, technical skills, etc.)
   f. budget and funding (information and most pressing issues related the budget, funding and support for climate change-related statistics in the country)

4. Main results of the CCDE data gap assessment: i.e., priority of demanded climate change indicators and their availability status.

5. Summary indicator table

<table>
<thead>
<tr>
<th>Plan, policy, agenda</th>
<th>Number of indicators demanded</th>
<th>Number of indicators with (potential) data</th>
<th>Number of indicators with no data</th>
</tr>
</thead>
</table>

6. Conclusions and recommendations
Annex C. Using ADAPT to identify climate change data needs and gaps

To assist countries to identify and assess data gaps of their national statistics systems (NSS), PARIS21 has developed the Advanced Data Planning Tool (ADAPT), an innovative, open-access, and web-based planning tool that national statistical offices (NSOs) and other actors producing data can use to better adapt their data production to the priority data needs derived from policy documents and international reporting frameworks (PARIS21, 2019[5]). In the context of enabling policy environments to support data-driven sustainable development, ADAPT includes all Sustainable Development Goal (SDG) indicators and has been updated to incorporate the UN Global Set of Climate Change Statistics and Indicators.

As a consultative platform, ADAPT is a space to bring together relevant actors for the production of effective CCDEs. It is a useful tool to compare existing demand for climate-specific information with available supply as it provides the framework to create an inventory of data supplies and of various stakeholders’ roles, capacities and skills (PARIS21, 2019[6]). As illustrated in Figure B.1, this helps identify data gaps and assess the extent to which available climate indicators satisfies users’ demands and priorities. ADAPT also provides a basis to plan for data needs and organise elements and relations in a particular data ecosystem, thereby helping to align data supply with national policy priorities.

Figure B.1. The ADAPT workflow

The content of ADAPT is managed by national agencies within an NSS. Inputs are provided by the NSO and relevant ministries, and multiple users can use the tool simultaneously. The ADAPT data planning reports:

- **Capture demand.** ADAPT provides an overview of the availability and applicability of selected climate change indicators in the country. These can include national priority climate indicators – example, indicators derived from the current national development plan, national adaptation plan and nationally determined contribution – as well as climate-specific SDG indicators. In terms of national indicators, the ADAPT expert and the NSO should review national policies and regulations to identify national climate indicators that can be uploaded to and analysed through ADAPT to catalogue demand at the global, regional and national policy levels.

- **Identify data gaps.** ADAPT allows the presentation of each indicator by the producing agency, prevailing data source, dissemination means (publication, database, etc.), frequency of data collection and last publication, and feasibility of production. ADAPT can also be used to identify potential producers of indicators, taking into account the producers’ level of production feasibility and dependency on additional technical assistance.

- **Improve data planning.** ADAPT helps verify the policy relevance of agreed indicators that refer to nationally and internationally agreed frameworks; identify data priorities that have not been addressed; and monitor implementation including by identifying policies and sectors without operational monitoring and evaluation frameworks.

Annex D. Relevant state and non-state actors of the climate change data ecosystem

Relevant state and non-state actors within the climate change data ecosystem (CCDE) are clustered according to the potential role they can play around climate change data. This annex presents a non-exhaustive list of key common actors of a CCDE.

Data users and producers

Primary data providers and producers to be considered in climate reporting can include actors from the following agencies:

- National statistical office (NSO) – The NSO produces statistics and indicators mainly based on secondary data from line ministries. However, the NSO is also the primary entity for population data, which are crucial to understanding climate change impacts. In some cases, the NSO also collects primary environmental data, for example through a module of a specific regular survey.

- Line ministries
  - Ministry of environment, ministry of natural resources or national climate change reporting authorities – As the leading entities in the production, collection and use of climate change data, these can produce data on emissions, biodiversity, flora and fauna species, forest and ecosystems areas, sea-level rise, coastal zone areas, and erosion.
  - Ministry of energy – This ministry has a crucial role in terms of climate change data as it both produces and uses data on energy production and consumption, fossil fuels imports and exports, and renewable energy production and consumption.
  - Ministry of agriculture – Agriculture is linked to climate change through its greenhouse gas contributions and role in ensuring sustainable food security, making this ministry an essential partner in the CCDE. It can produce and use information on land use, livestock, fertilisers, crop yields, soil types and erosion, food security, and climate-resilient agricultural practices.
  - Ministry of health – This ministry has a multifaceted role in addressing climate change by protecting public health, promoting awareness, ensuring healthcare system resilience and advocating for policies that prioritise health in the context of climate change. It can produce and use data on the incidence of climate-related vector-borne diseases and mortality related to heat and cold.
  - Ministry of finance – This ministry drives climate action by managing financial resources, incentivising green investments and mobilising climate finance. In terms of data, it is a vital actor for data on environmental protection expenditure, international flows for climate change responses, and the total budget and resources dedicated to measures that address climate change.
  - Ministry of planning – This ministry is a relevant data user and critical actor in charge of the design, implementation and monitoring of national plans and policies, which often identify climate change as a national priority. Due to its role in shaping a country’s development and ensuring that resources are allocated efficiently to achieve sustainable development, the ministry of planning can
help mobilise actors within the CCDE and ensure that the data are used for monitoring sustainable goals and government actions.

**Government agencies, offices and departments:**

- Meteorological office – It has a prominent role in the CCDE, particularly regarding data on temperature, wind, clouds, air quality and weather that are crucial for planning, implementing and expanding measures to predict, mitigate and adapt to the effects of climate change.
- Disaster management agency – Helping communities and governments prepare for and respond to climate change-related disasters, a country’s disaster management agency is a CCDE data actor that produces and uses data on hazardous events and disasters, hazard-prone areas and vulnerable infrastructures.
- National insurance regulatory authorities – Insurance can provide incentives to reduce risk and drive sustained adaptation measures. As such, data on insurance premiums incurred due to climate-related events have a relevant role in the adaptation process.
- Maritime authority, national water agency and/or similar bodies – These entities produce and use data that contribute to climate change evidence and monitoring including data related to water supply, water quality, and general characteristics of the ocean, freshwater resources and wastewater.

Beyond the national statistical system (NSS), other actors such as non-government organisations (NGOs), the private sector, development partners, civil society communities and individuals can provide data relevant to climate change and could contribute to the collection and analysis of such data by NSS actors.

- Data users – Data consumers that potentially use, process and analyse climate change data, data users can be at a global, national, and/or local level and include policy makers and governments, academia, think tanks and research institutes, private sector across, civil society, NGOs, media, infomediaries and intermediaries, among others.
- Other potential data providers and/or producers beyond the NSS – Examples include NGOs and actors considered to be outside the NSS that generate and store climate change data relevant to the country as part of their processes. Such organisations can include civil society, academia and research institutes, the private sector, infomediaries and intermediaries, and civil society through citizen-generated data, etc.
- Partners for developing skills and knowledge – Potential partners with strong technical expertise on climate change can collaborate with the NSO and its partners to develop specific skills and valuable knowledge for any process along the data value chain. Such processes can include, for example, data collection in a specific area related to climate change, data storage and management, and the use of novel data sources to complement existing statistics.
- Advocacy actors – These actors include groups and organisations involved in the processes of sharing, disseminating and communicating climate change data for raising awareness, among them civil society, NGOs, media, infomediaries and intermediaries.

Resource mobilisation actors – Such actors are organisations and entities providing funding and technical assistance for capacity development linked to climate change data and statistics production, use and dissemination. They can be development partners, international organisations, government agencies and donors, among others.
Mobilising Climate Change Data Ecosystems: A Framework and Toolkit