Technical Report

UNFCCC Standing Committee on Finance

First report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement

United Nations
Framework Convention on
Climate Change

In memory and honour of BERNARDITAS DE CASTRO-MÜLLER, a passionate woman, committed to climate justice, who has fought for the needs of developing country Parties since the beginning of the UN Framework Convention on Climate Change. May her legacy continue to live on in the regular updates of the needs determination report and continue to inspire people to fight climate change for developing countries.

ACKNOWLEDGEMENTS

Special thanks go to the contributors of the technical report, Aidy Halimanjaya, George Mwaniki, Sandra Guzmán Luna and Maria Athena Ballesteros, for their valuable contribution in the collection and analysis of data and information and the preparation of this report.

Thanks also goes to interns Greta Dobrovich, Jada Ford, Gözde Mavili, Claudio Protano, Leonard Schmidt and Lea Stromowski for their generous support in the data collection.

Acknowledgments and appreciation go to all external contributors and their teams. Special recognition and thanks are due to the Adaptation Fund, African Development Bank, Asia Development Bank, Green Climate Fund, Global Environment Facility and International Energy Agency.

In addition, appreciation goes to the numerous experts who offered views and perspectives at four technical stakeholder dialogues and three regional outreach webinars conducted during the course of 2020 and 2021, respectively. Although they are too numerous to mention individually, their contributions are deeply appreciated.

Within the SCF, the first report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement was prepared under the guidance of the co-facilitators, Zaheer Fakir and Mattias Frumerie. The report has benefited from inputs and guidance from members, including Diann Black Layne, Gabriela Blatter, Randy Caruso, Sergey Chestnoy, Delphine Eyraud, Ivan Zambrana Flores, Fiona Gilbert, Paul Herbert Oquist Kelley, Ali Waqas Malik, Mohamed Nasr, Zerihun Getu Mekuria, Hussein (Seyni) Nafo, Vicky Noens, Eva Schreuder, Ayman Shasly, Toru Sugio, Ismo Ulvila, Gertraud Wollansky and Liucai Zhu.

For further information contact:

Climate Finance subdivision
Means of Implementation division

United Nations Climate Change Secretariat (UNFCCC)
Platz der Vereinten Nationen 1
53113 Bonn, Germany

E-mail: standingcommittee@unfccc.int

https://unfccc.int/topics/climate-finance/workstreams/needs-report

LIST OF ABBREVIATIONS

AAAA	Addis Ababa Action Agenda
AC	adaptation communication
ADB	Asian Development Bank
AE	advanced economies
AF	Adaptation Fund
AfDB	African Development Bank
AILAC	Independent Association of Latin America and the Caribbean
AR	assessment report of the intergovernmental panel on climate change
BAU	business as usual
BUR	biennial update report
CBIT	Capacity-building Initiative for Transparency
CCS	carbon capture and storage
CCUS	Carbon capture utilization and storage
CCSM4	community climate system model
CDM	clean development mechanism
CGE	Consultative Group of Experts
CMA	Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
CORDEX	coordinated regional climate downscaling experiment
COVID-19	coronavirus disease 2019
CO2	carbon dioxide
CO2 eq	carbon dioxide equivalent
CPEIR	Climate Public Expenditure and Institutional Review
DIVA	dynamic interactive vulnerability assessment
DTU	Technical University of Denmark
EME	emerging market economies
ETF	enhanced transparency framework
EU	European Union
GACMO	greenhouse gas abatement cost model
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GIZ	German Agency for International Cooperation
IEA	International Energy Agency
IFC	International Finance Corporation
IMF	International Monetary Fund
INDC	intended nationally determined contribution
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
LAC	Latin America and the Caribbean
LDC	least developed country
LDCF	Least Developed Countries Fund
LEAP	long-range energy alternatives planning system
LEDS	low-emission development strategy(ies)
LEG	Least Developed Countries Expert Group
LIC	low income countries
LoCAL	local climate adaptive living
LULUCF	land use, land-use change and forestry
MAC	marginal abatement cost
MDB	Multilateral Development Bank
MENA	Middle East and North Africa
MRV	measurement, reporting and verification
NAMA	nationally appropriate mitigation action
NAP	national adaptation plan
NAPA	national adaptation programme of action
NBF	needs-based finance (project)
NC	national communication
NDC	nationally determined contribution
NDR	report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement
NGO	non-governmental organization
non-Annex I Party	Party not included in Annex I to the Convention
NPS	stated policies scenario
OECD	Organisation for Economic Co-Operation and Development
ODA	Official Development Assistance
PCCB	Paris Committee on Capacity Building
SCF	Standing Committee on Finance
SBI	Subsidiary Body for Implementation
SDG	sustainable development goal
SDS	sustainable development scenario
SIDS	small island developing state(s)
SSE	small state countries
STAR	System for Transparent Allocation of Resources
TAP	technology action plan
TNA	technology needs assessment
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY BY THE STANDING COMMITTEE ON FINANCE OF THE FIRST REPORT ON THE DETERMINATION OF THE NEEDS OF DEVELOPING COUNTRY PARTIES RELATED TO IMPLEMENTING THE CONVENTION AND THE PARIS AGREEMENT

I. Introduction

1. The first NDR[1] provides an overview of qualitative and quantitative information based on data and evidence from reports at the national, regional and global level. As such, the first NDR does not constitute an assessment of the needs of developing country Parties: the numbers of reported and costed needs are higher in the reports of some countries than of others. This does not imply that the latter have no or fewer needs; rather, this may be due to the lack of available data, tools and capacity for determining and costing needs.

II. Context and mandate

2. COP 24 requested the SCF to prepare, every four years, an NDR for consideration by the COP, starting at COP 26, and the CMA, starting at CMA 3. The COP also requested the SCF to collaborate, as appropriate, with the operating entities of the Financial Mechanism, the subsidiary and constituted bodies, multilateral and bilateral channels, and observer organizations.[2]

3. COP 25 and CMA 2 encouraged the SCF to present, to the extent possible, disaggregated information in relation to, inter alia, mapping data availability and gaps by sector, assessing climate finance flows and presenting information on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement.[3] COP 25 and CMA 2 also encouraged the SCF, in implementing its strategic outreach plan, to build on existing efforts to reach out to developing country Parties and relevant developing country stakeholders when generating data and information for the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement.[4]

III. Scope and approach

A. Scope

4. The first NDR presents quantitative information (hereinafter referred to as costed needs) and qualitative information (hereinafter referred to as needs) on the needs of developing country Parties. Quantitative information was compiled from costed needs at the project level and those derived from economic modelling in reports at the national, regional and global level and other available sources. Qualitative information was derived from descriptions of planned activities, strategic directions, national priorities and action plans in the same sources.

5. To the extent possible and on the basis of the available information, the first NDR contains an analysis and presentation of the needs of developing country Parties by time frame, geographical region, thematic area, means of implementation, and sector and subsector (chap. 2). The report reflects information and data on needs as mentioned in the national, regional and global reports. The needs are dynamically challenging and may depend on different factors, such as temperature scenarios, mitigation pathways and adaptive capacity, extreme weather events, adverse effects of trade and economic barriers, and social factors such as poverty.

6. Further, the first NDR illustrates processes and approaches for determining needs (chap. 3). It also maps out available tools and methodologies for determining and prioritizing needs, including sector-specific methodologies and tools, and advantages of and challenges in applying them (chap. 4). Finally, the report highlights opportunities, challenges and gaps in relation to determining needs (chap. 5).

1) Available at https://unfccc.int/documents/307595.
2) Decision 4/CP.24, paras. 13–14.
3) Decisions 11/CP.25, para. 9; and 5/CMA.2, para. 9.
4) Decisions 11/CP.25, para. 12; and 5/CMA.2, para. 12.

7. The first NDR comprises an executive summary and a technical report. The executive summary was prepared by the SCF, whereas the technical report was prepared by experts under the guidance of the SCF but remains a product of the external experts. The technical report has benefited from extensive inputs from Parties and stakeholders.

B. Sources of information

8. The first NDR has been compiled from reports prepared by developing country Parties, specifically those submitted to the UNFCCC, and reports developed by regional and global institutions. Such national reports include ACs, BURs, LEDS, NAPs, NAPAs, NCs, NDCs, TAPs and TNAs.

9. Further sources of information are the submissions received from Parties and non-Party stakeholders in response to the call for evidence issued by the SCF.[5]

C. Approach

10. The technical work comprised a review of literature and sources of available information and data, and quantitative and qualitative data collection and analysis, complemented by outreach activities. Data and information were systematically collected by the technical team under the guidance of the SCF co-facilitators for the first NDR.

11. The SCF periodically considered the outputs of the technical team and the input derived from regional meetings, and provided guidance on the development of the first NDR, including during conference calls and in-person meetings.

12. In preparing the first NDR, the technical team noted data inconsistencies, gaps and interpretation challenges, as referred to in paragraph 59 below. Efforts were made to overcome these challenges, such as identifying reporting overlaps on the basis of the reporting guidelines and avoiding double counting in aggregating and presenting the data.

IV. Key findings

A. Overview of the needs of developing country Parties

1. Information and data from national reports

13. National reports submitted by developing country Parties as part of the UNFCCC process contain information on their needs related to implementing of the Convention and the Paris Agreement. There are nine types of national report, which serve different purposes under the Convention and the Paris Agreement, with reported needs varying in terms of thematic and sectoral coverage, time frame and granularity level of detail. In total, 563 documents were included in the analysis for the first NDR.[6]

14. Figure 1 provides an overview of the articulation of the needs of developing country Parties, including overall costed needs, across the nine types of national report submitted by developing country Parties to the UNFCCC.[7] The overall costed needs by type of report are based on the information on activities with associated costs included in the corresponding individual national reports. The needs included in national reports are identified using a top-down approach (i.e. needs that are typically estimated using economy-wide or sectoral modelling techniques) or a bottom-up approach (i.e. needs that are typically identified from a project pipeline). Developing country Parties periodically update their national reports submitted to the UNFCCC, reflecting changing circumstances and improvements in their data-collection processes and analysis. Therefore, data and information on needs may not be exhaustive as the needs are dynamically changing.

(a) Insights from quantitative data on needs

15. The needs identified and articulated by developing country Parties across the nine types of national report encompass a wide range of financial, technology

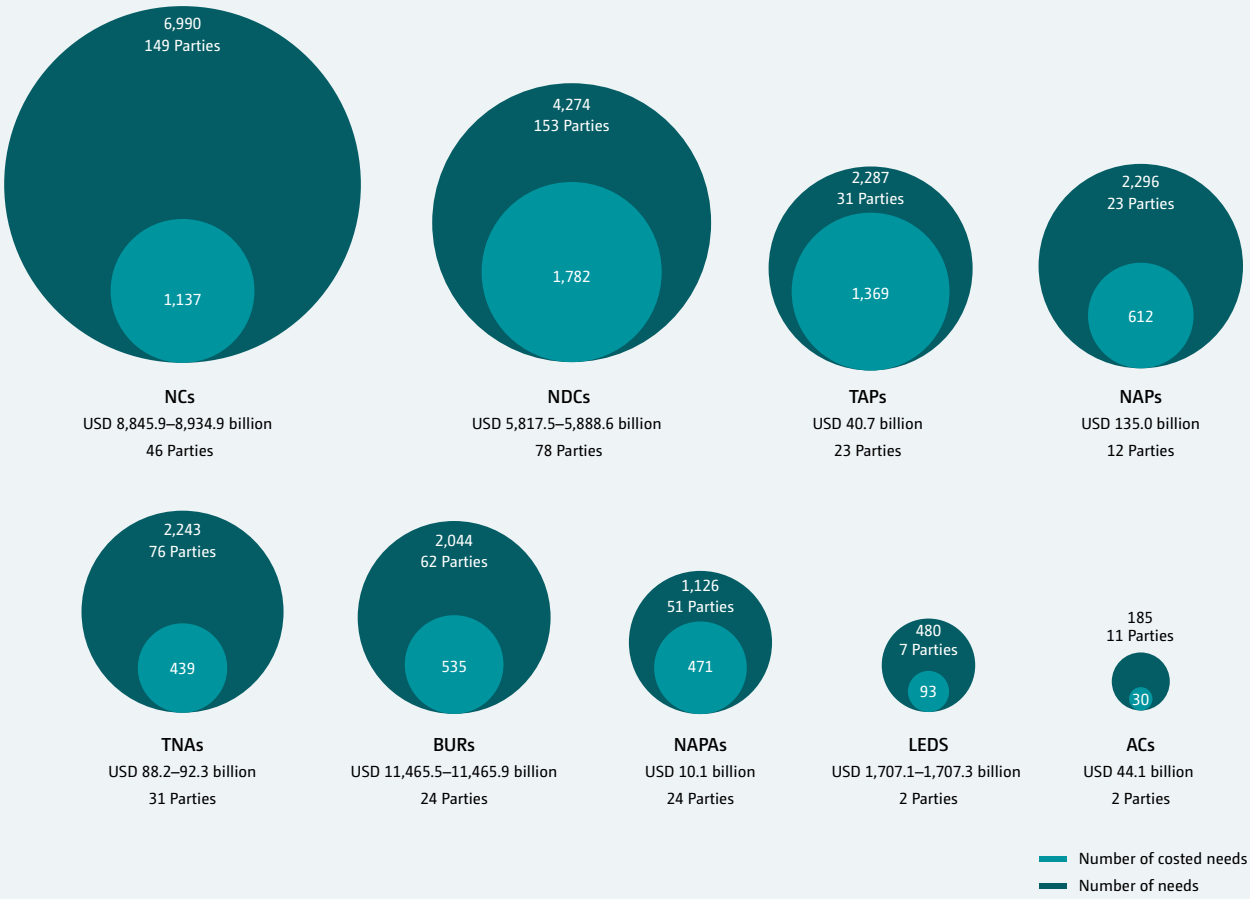
5) See https://unfccc.int/documents/231567. The deadline of the call for evidence was extended to 30 October 2020 by, which 34 submissions had been received. All submissions are available at https://unfccc.int/topics/climate-finance/workstreams/needs-report/repository-of-information-on-the-needs-of-developing-country-parties.

6) Only the most recent submissions to the UNFCCC were used in the analysis as Parties regularly update information on their needs to reflect changing circumstances. To avoid double counting where Parties may have provided the same information in different reports (e.g. BURs and NDCs), each type of report is treated separately, without aggregation across them.

7) Needs are catalogued in the analysis at the most granular level at which information was provided (i.e. a project or activity expressed as a need by developing countries is counted as a single activity; if activity-level information is not provided, needs are counted at the sector level; if sector-level information was not provided, needs are counted at the thematic level, etc.). Depending on the nature of the report, it is possible that the priorities and programmes consist of multiple projects and action items. See chap. 1 of the first NDR for details on the scope of the quantitative and qualitative information collected from national reports.

Figure 1

Overview of articulation of needs including costed needs by type of national report submitted to the UNFCCC



Notes: Ranges of costs included where available.

development and transfer, and capacity-building needs. The level of detail in the information provided varies in terms of the description of needs and their associated costs, if specified. While some Parties express costed needs for adaptation or mitigation purposes, other communicate needs at the activity or sector level.

16. As at 31 May 2021, NDCs from 153 Parties included 4,274 needs, with 1,782 costed needs identified across 78 NDCs, cumulatively amounting to USD 5.8–5.9 trillion up until 2030. Of this amount, USD 502 billion is identified as needs requiring international sources of finance and USD 112 billion as sourced from domestic finance. For 89 per cent of the costed needs, information was not provided on possible sources of finance. Among the national reports, NCs from 149 Parties present the highest number (6,990) of identified needs, of which 1,137 costed needs cumulatively amount to USD 8.8–8.9 trillion, with 5 per cent of the costed needs distributed across 45 NCs and 95 per cent in 1 NC. BURs from 62 Parties indicated 2,044 needs, of which 535 needs are costed, cumulatively amounting to USD 11.5 trillion, with 5 per cent distributed across 60 BURs and 95 per cent across 2 BURs, thereby representing the highest amount of costed needs identified across the nine types of national report. These figures should be viewed in the light of the size and nature of developing country Parties' economy and the scale of climate impacts on them.

(i) Thematic distribution of costed needs

17. As shown in table 1, cumulatively, identified costed mitigation needs tend to be larger than costed adaptation needs across the reports that cover all thematic areas such as BURs, NCs and NDCs. The overall amount of costed adaptation needs is comparable to the overall amount of costed mitigation needs expressed in NCs (43 and 56–57 per cent, respectively). In the case of NDCs, the overall identified costed mitigation and adaptation needs (50 per cent) are comparable to the amount of costed cross-cutting needs (50 per cent), noting that the costed needs expressed as cross-cutting are largely a reflection of one NDC. Although some developing countries provided information on costed needs for mitigation and adaptation by sector and subsector, this information was not provided across all reports. Therefore, it was not possible to provide a comprehensive and accurate overall amount of costed needs by sector and subsector in the first NDR.

18. Although developing country Parties identified more adaptation than mitigation needs, more costs were identified for the latter. This may not imply that mitigation needs are greater, but rather be due to the lack of available data, tools and capacity to assessing adaptation needs (see the information on challenges and gaps in paras. 61–66 below).

(ii) Regional distribution

19. Available information related to costed needs varies across regions (see table 2). African countries included 1,529 needs in their NDCs, of which 874 were costed, amounting to USD 2.5 trillion. NDCs of countries in the Asia-Pacific region included 1,677 needs, of which 630 needs were costed, cumulatively amounting to

Table 1

Overview of sources of reported costed needs of developing countries by type of national report submitted to the UNFCCC

Report	Costed needs (USD billion)				
	Total	Mitigation	Adaptation	Cross-cutting	Other
AC	44.10 (100%)	–	44.10 (100%)	–	–
BUR	11,465.53–11,465.90 (100%)	5,286.94–5,287.31 (46%)	3,628.81 (32%)	2,550.01 (22%)	–
LEDS	1,707.15–1,707.35 (100%)	1,407.15–1,407.34 (82%)	300.00 (18%)	–	–
NAP	135.02–135.03 (100%)	–	135.02 (100%)	–	–
NAPA	10.05 (100%)	–	10.05 (100%)	–	–
NC	8,845.85–8,934.94 (100%)	5,019.30–5,033.83 (56-57%)	3,812.06–3,882.07 (43%)	2.23 (>0%)	12.25–16.81 (>0%)
NDC	5,817.48–5,888.56 (100%)	2,156.05–2,156.13 (37%)	764.24–835.24 (13–14%)	2,893.39 (49–50%)	3.81 (>0%)
TAP	40.74 (100%)	21.97 (54%)	18.76 (46%)	–	0.01 (>0%)
TNA	88.24–92.33 (100%)	30.33–34.33 (34–37%)	57.9–57.98 (63–68%)	0.01 (>0%)	–

Notes: (1) Ranges of costs included where available; (2) The percentages given are the percentages of the type of costed need for each report type.

Table 2

Number and cost of needs expressed in nationally determined contributions by region

Region	Number of expressed needs	Number of expressed needs with financial information (i.e. costed needs)	Costed needs based on available financial information (USD billion)
African States	1,529	874	2,459.56–2,460.56
Asia-Pacific States	1,677	630	3,180.39–3,250.39
Eastern European States	282	112	9.36
Latin American and Caribbean States	771	166	168.18–168.26
Western European and other States	15	–	–

Note: Ranges of costs included where available.

USD 3.2–3.3 trillion. Of the 771 needs expressed in the NDCs of countries in the Latin America and Caribbean region, 166 NDCs included costed needs, cumulatively amounting to USD 168.2–168.3 billion, of which almost 60 per cent was in one NDC. NDCs of developing countries from the Eastern European region included 282 needs, of which 112 were costed, cumulatively amounting to USD 9.36 billion.

20. Some Parties reported information on potential needs related to averting, minimizing and addressing loss and damage, either through specific adaptation activities that include objectives related to averting, minimizing and addressing loss and damage; referenced damage incurred owing to recent climate-related events such as droughts and severe weather; or modelled potential future impacts of climate on GDP or economic losses in a given year (e.g. 2030 or 2050). The information was also reported in the context of national circumstances, climate impacts and/or needs depending on the reporting Party.

21. As noted in paragraph 5 above, needs expressed in national reports are dynamically changing and, therefore, data and information thereon may not be exhaustive. While the number of needs and costed needs communicated in national reports is lower for some regions than others, this does not mean that those regions have no or fewer needs. Rather, this may be due to lack of available data, tools and capacity for determining and costing needs. Therefore, the number of needs and costed needs compiled from national reports available at the time of preparation of the first NDR should not be used to draw comparisons of the actual needs across regions.

(b) Insights from qualitative data on needs

(i) Thematic distribution

22. Overall, needs related to adaptation are mentioned more often than those related to mitigation in all report types except BURs and LEDS, indicating greater attention to supporting developing countries' expressed adaptation needs. For example, as shown in figure 2.1, NDCs included 1,991 needs for adaptation and 1,956 for mitigation.

(ii) Regional distribution

23. When the number of expressed needs across the nine national report types is considered, developing country Parties in the Africa and Asia-Pacific regions identified comparable numbers of needs across the national reports with broad thematic and sectoral coverage such as BURs, NCs and NDCs, comparable with the Latin America and Caribbean region only in the case of BURs (see figure 2.2). Developing country Parties in the Asia-Pacific region used NAPs and TAPs to

further specify adaptation needs, as more than half of the needs identified in NAPs and TAPs were from this region. Developing country Parties in the Latin America and Caribbean, and Eastern European regions expressed more needs in their NCs than in other national reports. Latin American and Caribbean Parties expressed a considerable number of adaptation needs in adaptation-specific national reports (e.g. ACs and NAPs) when compared with the overall number of needs expressed in their BURs and NDCs. Developing country Parties in the African region expressed more needs through TNAs compared with other regions, reporting 993 needs compared with the 642 needs identified by Parties in the Asia-Pacific region.

(iii) Distribution by means of implementation

24. Qualitative data show a significant prevalence of capacity-building and technology development and transfer needs, which, in part, may be owing to the resources developing countries can access to support the identification of these needs. The number of capacity-building needs is higher than finance needs and technology development and transfer needs identified in the nine national report types except for TNAs (see figure 2.3). Capacity-building needs expressed across the national reports typically cover areas such as research, training and education, awareness-raising, institutional strengthening and coordination, and policy development.

(iv) Sectoral and subsectoral distribution

25. On the basis of the number of mitigation needs expressed across the nine national report types, energy is the lead sector for climate change mitigation actions, followed by land use and forestry, transport, agriculture, and waste and sanitation (see figure 3.1).

26. When considering mitigation needs by sector and subsector, the nine types of national report show that most needs in the **energy sector** relate to requests for support for the energy efficiency and renewable energy subsectors, albeit with some variations between them. In NDCs, needs for renewable energy development were identified almost twice as frequently as those for energy efficiency (399 and 261, respectively) but the total nominal value of energy efficiency projects was 1.5 times larger than that of renewable energy projects (USD 377.22 billion and USD 198.08 billion, respectively). In BURs and NCs, more needs related to renewable energy than to energy efficiency were identified. TNAs included a larger variation among energy subsectors, including the development of natural gas, the phasing-out of inefficient subsidies, the exploration of carbon capture and storage, and the development of the efficient use of coal.

27. The majority of expressed mitigation needs in the **land-use and forestry sector** represented a few densely forested countries, such as Bhutan, Brazil, the Congo, Costa Rica, Ghana, Guyana, the Lao People's Democratic Republic, Malaysia, Papua New Guinea, Suriname, the United Republic of Tanzania and Viet Nam. This sector covers key activities such as reforestation, forest fire prevention, social forestry development, sustainable forest management, development of sustainable supply chains for forest commodities, spatial planning forestry research and some land-use activities, such as management of livestock. Data in NCs and NDCs showed that, within this sector, needs related to reforestation are the largest needs expressed in financial terms.

28. On the basis of the number of adaptation-related needs expressed across the nine national report types, agriculture and water are the two lead sectors for climate change adaptation actions, followed by disaster prevention and preparedness, coastal zone management and health (see figure 3.2).

29. Adaptation needs in the **agriculture sector** cover a wide variety of land uses that overlap with other key sectors. Needs related to agroforestry and irrigation, for example, also touch on areas or land managed under the forestry and water sectors. Needs related to the agriculture sector relate to crop diversification, development of resistant crops, land and soil management, livestock management, and fisheries and aquaculture.

30. Adaptation needs in the **water sector** are dominated by the need for water distribution infrastructure, water harvesting and irrigation. Other types of need in this sector vary widely and cover water resource management, water storage and water sanitation. In NDCs, about 38 per cent of expressed needs in the water sector include financial information. Water distribution infrastructure, including wastewater treatment, was the largest need in financial terms across all types of report.

(c) Other areas of needs

31. Developing country Parties also communicate other areas of needs that involve issues such as gender, indigenous peoples and vulnerable groups. However, across the nine national report types, less than 10 per cent of needed activities referred to gender or specific communities. Where these topics are included in national reports, information tends to relate to commitments, policies and/or strategies.

32. Some reports that expressed needs for policy development were linked to the SDGs and the Addis Ababa Action Agenda. In general, the implementation of climate actions is mainstreamed in SDG-related actions. However, a few reports expressed needs focusing on institution-building and policy development, aiming to link climate commitments with the SDGs; for example, Jordan's need to align its intended nationally determined contribution with the SDGs, and Morocco's needs (expressed in its NCs) to strengthen the National Institutional Framework of Climate Change through a regulatory system based on the Framework Law on the National Charter for Environment and Sustainable Development.

2. Information and data from reports by regional and global actors

33. Information and data on the needs of developing countries are also available from regional and global reports. For the mitigation needs of developing countries, these reports use a mix of climate economic modelling for scenarios of below 2 °C, ranging from USD 2.4 trillion to USD 4.7 trillion in annual energy-related investment needs globally;[8] investment opportunities based on stated national plans and targets including and beyond NDCs, ranging from USD 23.8–29.4 trillion for emerging markets from 2016 to 2030;[9] and investment estimates for achieving conditional NDC targets using carbon prices, for example USD 715 billion in Africa[10] (see figure 4 for an example of energy investment needs identified by the International Renewable Energy Agency[11]).

34. Reports based on energy–economy models note that developing country regions have the largest investment gaps compared with historical trends to achieving climate scenarios in line with the Paris Agreement. Three to fourfold increases of investment are necessary in both renewable energy and energy efficiency across many regions that include developing countries.

35. Regional and global reports also provide estimates related to adaptation and resilience. Costs based on bottom-up national and sector-based studies (ranging from USD 140 billion to USD 300 billion annually by 2030) measuring impacts to GDP (for example ranging from USD 289.2 billion to USD 440.5 billion up to 2030 in Africa) and the incremental investment needed to upgrade or retrofit infrastructure stock (ranging from USD 11 billion to USD 670 billion in annual incremental costs) are most prevalent.

36. To make current and future infrastructure climate-resilient, annual costs as a percentage of GDP are at least double in countries with emerging market economies, low-income countries and small States compared with the costs in high-income countries, that is 1.1–1.49 per cent compared with 0.45 per cent. Investment needs expressed as a percentage of GDP for upgrading new infrastructure and coastal protection are proportionally greater in lower-income countries and small States, while retrofitting existing infrastructure is the major cost component in countries with emerging market economies. However, the reports also noted that specific knowledge on the degree of exposure of infrastructure to natural hazards, related to their location, intensity and level of risk, could affect the incremental cost of making infrastructure climate-resilient (e.g. 3 per cent of total investment, as opposed to 8–45 per cent) (see figure 5[12]).

37. The information and data generated from the national, regional and global reports cannot be compared with each other as the reports have different time frames, objectives and scopes. However, all of the reports may be viewed as complementary in offering different insights, granularity and processes and approaches for identifying needs.

---

8) See Collum DL, Zhou W, Bertram C, et al. 2018. Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable Development Goals. *Nature Energy*. 3(7): pp.589–599; International Energy Agency. 2020. *World Energy Model Documentation*. Paris: IEA. Available at https://iea.blob.core.windows.net/assets/bc4936dc-73f1-47c3-8064-0784ae6f85a3/WEM_Documentation_WEO2020.pdf; and International Renewable Energy Agency. 2020. *Global Renewables Outlook. Energy transformation 2050.* Abu Dhabi: International Renewable Energy Agency. Available at https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020.

9) International Finance Corporation. 2017. *Climate Investment Opportunities in South Asia. An IFC Analysis.* Available at www.ifc.org/wps/wcm/connect/fa3bea68-20f1-4cb4-90b9-3e812d38067f/Climate+Investment+Opportunities+in+South+Asia+-+An+IFC+Analysis.pdf?MOD=AJPERES&CVID=l.raVua.

10) African Development Bank. 2021. *Needs of African Countries Related to Implementing the UN Framework Convention on Climate Change and the Paris Agreement.* Available at https://unfccc.int/sites/default/files/resource/Needs%20Report_African%20counties_AfDB_FINAL.pdf.

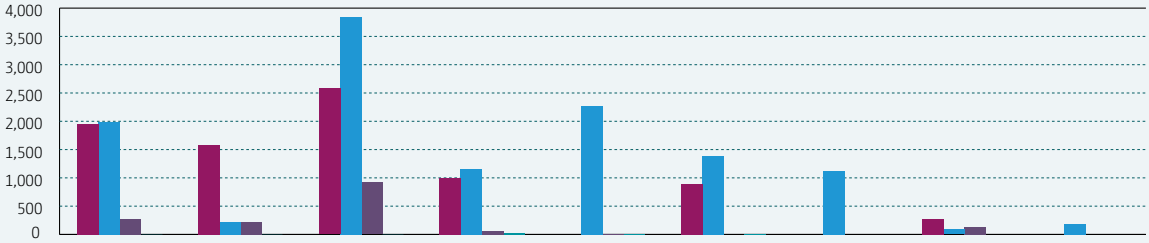
11) For the purpose of the first NDR, various data sources were used to illustrate needs of developing country Parties, without prejudice to the meaning of this term in the context of the Convention and the Paris Agreement, including but not limited to Parties not included in Annex I to the Convention and other classifications used in regional and global reports.

12) As footnote 11 above.

Figure 2

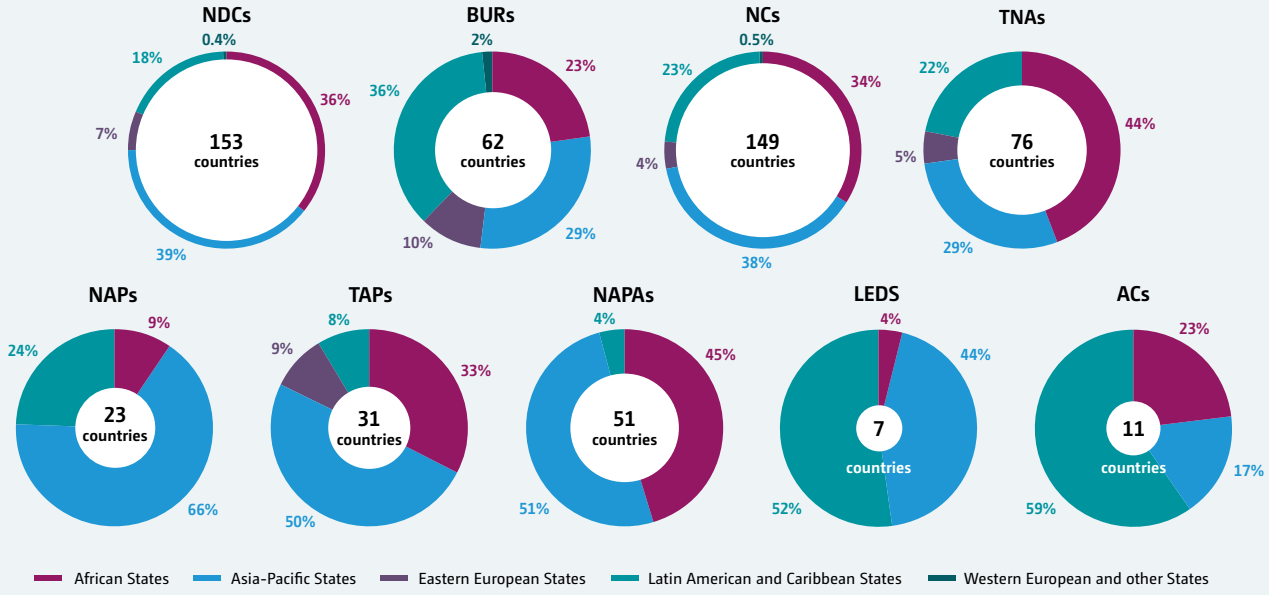
Needs expressed by developing countries in national reports by theme, region and means of implementation

2.1: By theme



	NDCs	BURs	NCs	TNAs	NAPs	TAPs	NAPAs	LEDS	ACs
Mitigation	1,956	1,588	2,579	998	-	890	-	267	-
Adaptation	1,991	224	3,841	1,156	2,270	1,390	1,126	87	185
Crosscutting	281	217	918	61	6	7	-	126	-
Unspecified	-	-	-	28	8	-	-	-	-

2.2: By region



2.3: By means of implemenation

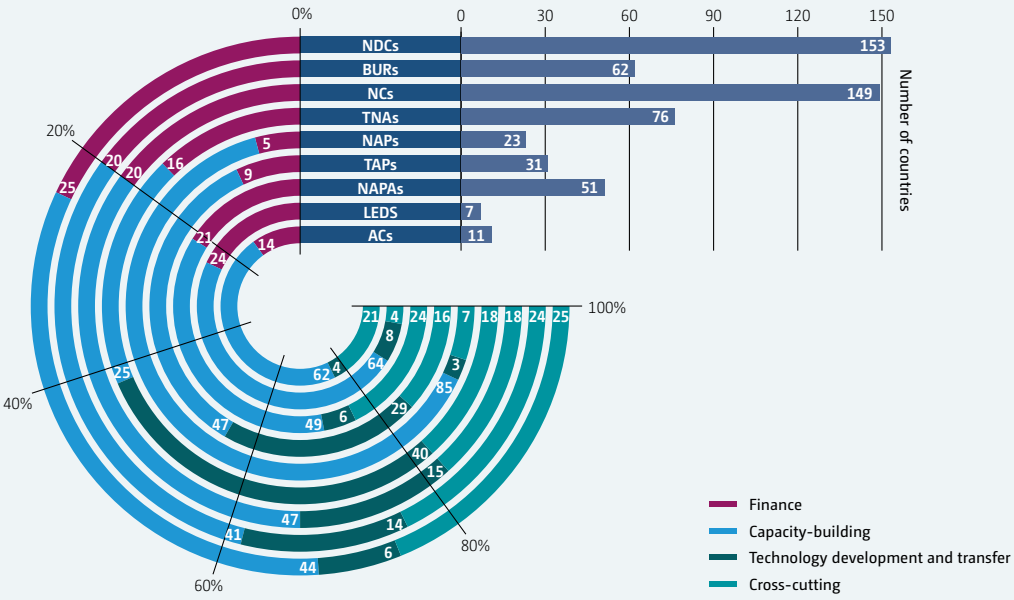
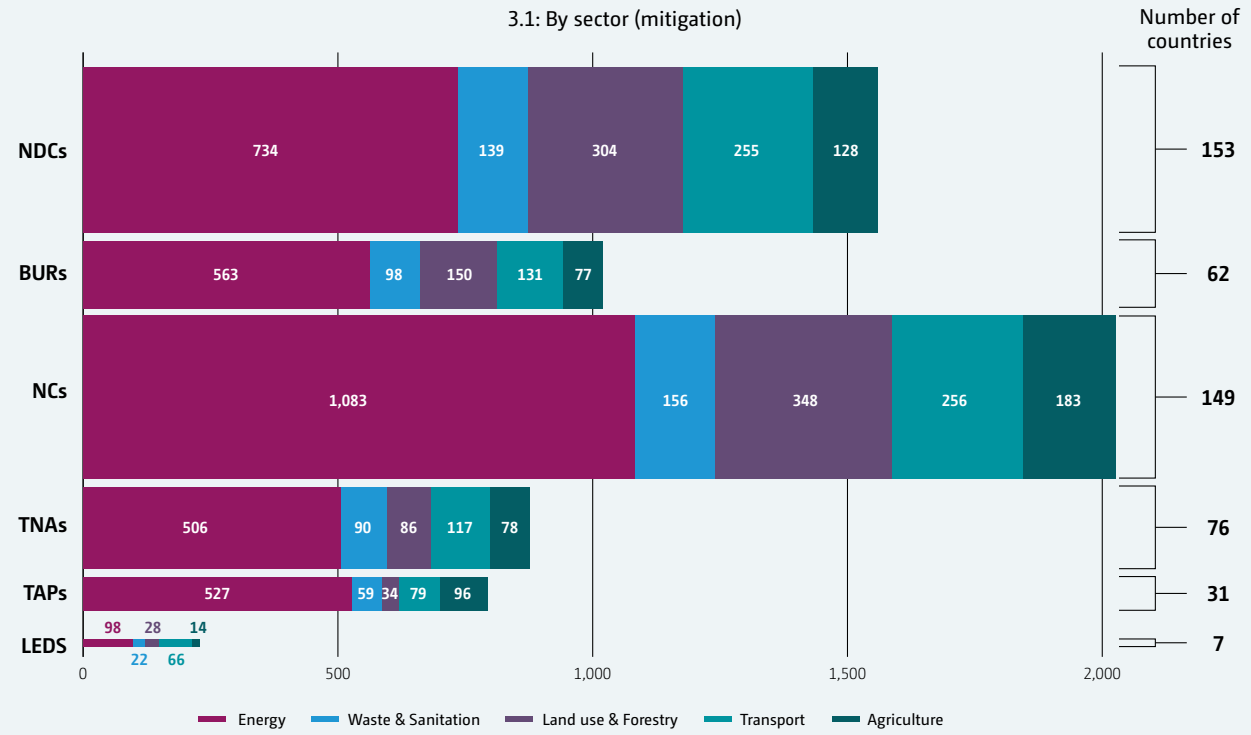


Figure 3

Needs expressed by developing countries in national reports by sector



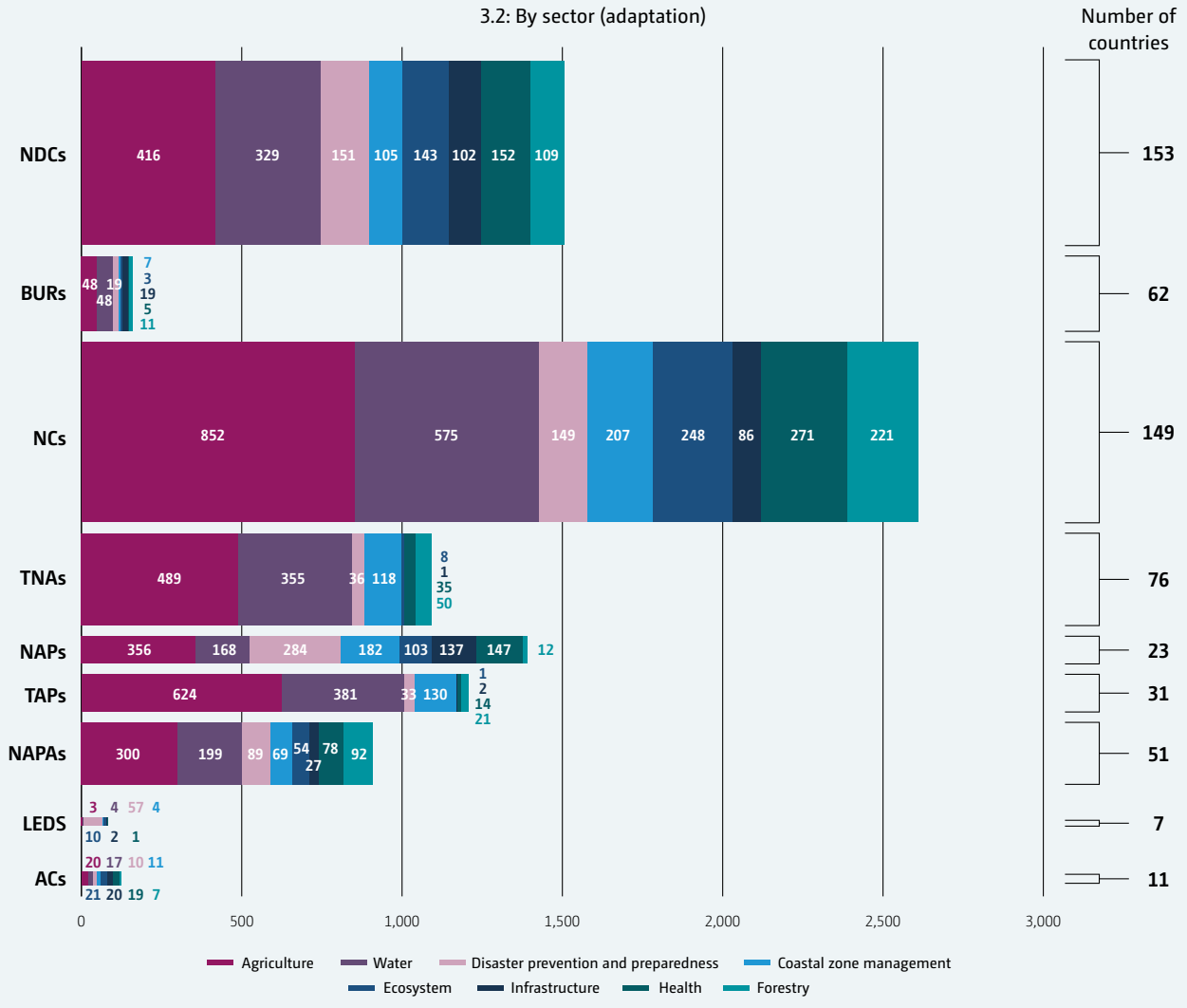
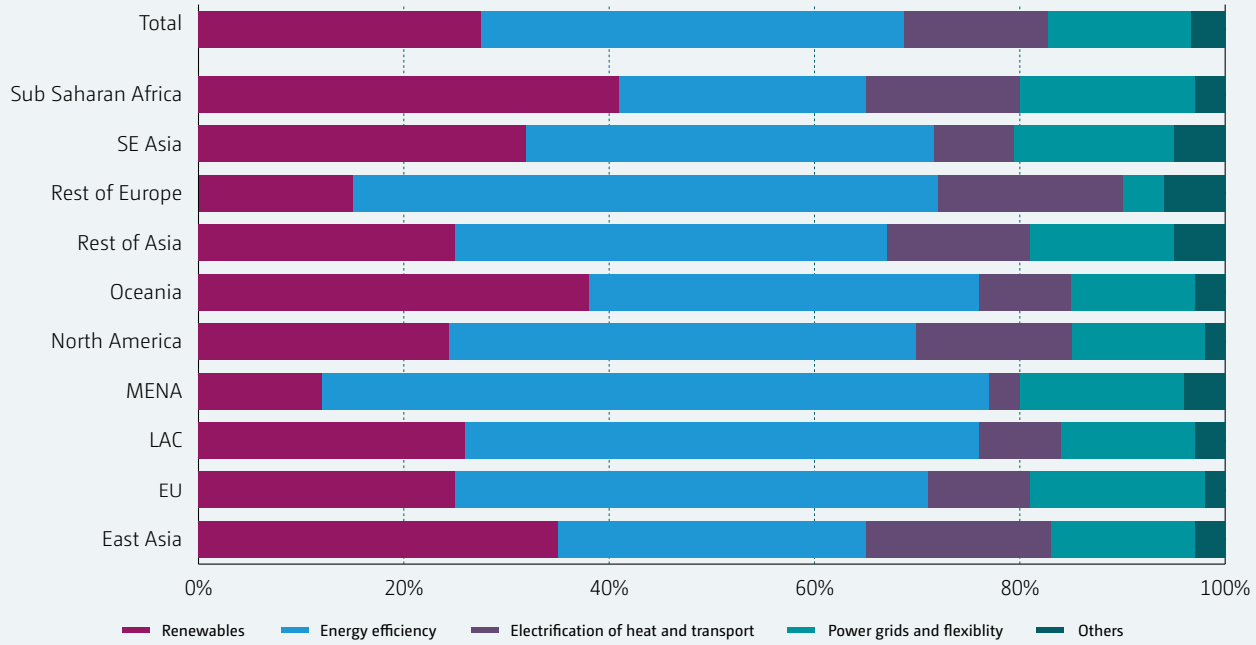


Figure 4

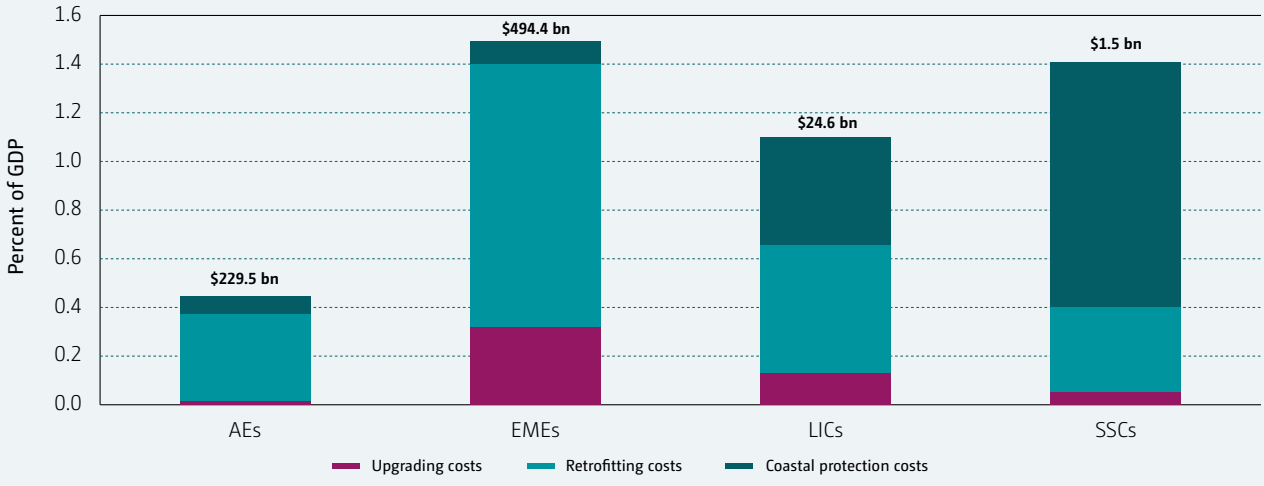
Shares of annual average clean energy investments in the International Renewable Energy Agency transforming energy scenario, by region, 2016–2050



Source: International Renewable Energy Agency. 2019. *Transforming the energy system – and holding the line on rising global temperatures*, International Renewable Energy Agency, Abu Dhabi. Available at: www.irena.org/publications/2019/Sep/Transforming-the-energy-system.

Figure 5

Public investment needs for resilience of physical infrastructure, by country groupings, (gross domestic product weighted average)



Source: International Monetary Fund. 2020. Fiscal Monitor. Policies for the Recovery. Washington, October.

B. Processes and approaches for determination of needs of developing country Parties

1. National institutional arrangements

38. Developing country Parties have varied institutional arrangements for identifying climate change needs, which are described in most of their national reports submitted to the UNFCCC. Most countries have established specialized institutions within their ministries and departments whose mandate is to spearhead climate change actions. These institutions have various names such as climate change directorate, climate change unit, interministerial climate change coordination committee, climate change technical working group and climate research centre.

39. Good practice in ensuring buy-in and effective coordination of the needs identification process is the engagement of high-level decision-making government offices at the initial stage of the climate change needs identification process. In addition, the engagement of other stakeholders and the assignment of specific roles and responsibilities to participants representing various sectors and interest groups at both the national and subnational level was noted in the reports of the majority of developing countries.

40. Institutional arrangements for needs determination vary widely across countries. However, in most countries the ministry responsible for environmental affairs coordinates the process through a focal point or a committee.

41. The focal point leads the needs identification process and can adopt varying arrangements for stakeholder consultation. The stakeholder consultation process leads to determining the institutional arrangements for the needs identification process. Some of the most common institutional arrangements include focal point only, focal point with other ministries and an interministerial committee. Among these, the interministerial committee is the most inclusive and likely to provide more detailed information on needs across sectors.

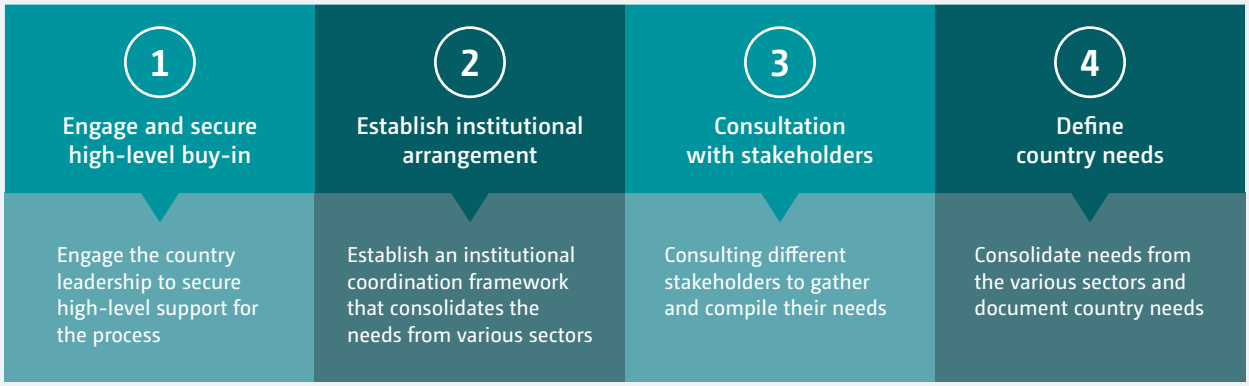
2. Needs identification process

42. The needs identification process of most countries starts with consultations between the lead ministry and the country's leadership. This ensures country ownership and top-level support in the needs identification process (see figure 6).

43. Stakeholder consultations are an integral part of the needs identification process. During the initial phase, background information is collected and assessments are carried out to help scope the needs. The stakeholders consulted are mainly from government line ministries, though in some instances they include non-governmental organizations and the private sector. Local communities are the least consulted stakeholders during the process.

Figure 6

Common steps adopted by countries' committees or units for identifying climate change needs



44. In most of the national reports, the description of the needs identification process does not explicitly mention inclusivity aspects. Needs related to gender and local communities are captured in some reports emanating from those processes. However, where the needs identification process has projects and programmes as part of its output, gender and other inclusivity aspects of various stakeholders were mostly elaborated in the project or programme documents.

3. Processes and approaches used by other actors, namely multilateral climate funds, multilateral development banks and United Nations agencies

45. MDBs and United Nations agencies play a critical role in supporting developing countries in their needs identification process. In most cases, these agencies use experts during country-driven needs identification consultation forums to provide insights and share data that may help developing countries better identify and report their needs.

46. In other instances, MDBs and United Nations agencies provide financial and technical support for developing countries in the needs identification process. This support is used to carry out in-depth sectoral analysis to identify pathways within these sectors where considerable effort is needed and where greater impacts can be achieved. For countries that have benefited from this support for their second NDCs, their reports provide more granular information on needs, including by sector, compared with their first NDCs.

47. The multilateral climate funds established under the Convention, namely the GEF, including the special climate funds managed by the GEF (the Special Climate Change Fund and the Least Developed Countries Fund), the Green Climate Fund and the Adaptation Fund, also play a critical role in providing financial support for countries in facilitating their climate change needs identification process. This is particularly evident in the case of the Green Climate Fund and Adaptation Fund readiness support and the GEF Capacity-building Initiative for Transparency Trust Fund, which enable countries to identify and prioritize their climate change needs.

C. Methodologies and underlying assumptions used in determining the needs of developing country Parties

1. Methodologies used at the national level by developing countries in national reports

48. Developing country Parties identify adaptation and mitigation needs in preparing their national reports, following UNFCCC reporting guidelines and guidance and, in some cases, other methodologies adapted to their national context. The approaches taken vary depending on institutional and human capacities, cost, geography, time frame and data availability.

49. Although recent national reports include more information about methodologies used to determine adaptation needs, overall, there is still more information about the methodologies used to determine mitigation needs than for adaptation needs. The types of methodology applied vary. Most methodologies used to identify mitigation needs are quantitative, while a lower number of qualitative methodologies are used to identify adaptation needs. However, in recent reports, some countries have used methodologies to identify both mitigation and adaptation needs.

50. Countries in the Africa, Asia-Pacific, and Latin America and Caribbean regions present region-level information about methodologies applied to determine mitigation needs. Countries in the Africa and Asia-Pacific regions also present information about methodologies used to determine adaptation needs.

51. UNFCCC reporting guidelines and guidance, such as those provided for TNA preparation, have facilitated identification of needs for technology transfer and capacity-building related to mitigation and adaptation actions through methodologies such as the TNA methodology and the guidance for preparing a TAP.[13] However, the existing reporting guidelines and guidance do not include specific provisions on how to assess these needs at the local level. As such, countries assess their needs on the basis of methodologies developed for application at the national or international level.

13) Technology Executive Committee. 2020. *Enhancing implementation of the results of technology needs assessments.* Bonn: UNFCCC. Available at https://unfccc.int/ttclear/tec/brief13.html.

52. Methodologies used by developing countries to determine mitigation needs include both top-down and bottom-up models for the energy and non-energy sectors. Bottom-up models are suited for studying options that have specific sectoral and technological implications. Top-down models are useful for studying broad macroeconomic and fiscal policies for mitigation, such as carbon or other environmental taxes. Methodologies applied to identify mitigation needs mainly focus on the cross-cutting, energy, greenhouse gas inventory preparation, waste, transport, agriculture, forestry, building and industry sectors.

53. Methodologies used by developing countries to determine adaptation needs mostly include vulnerability assessments that determine the levels of risk and vulnerability for each sector. These methodologies mainly focus on the agriculture, ecosystem and biodiversity, water and cross-cutting sectors.

2. Methodologies used at the regional and global level

54. For international and regional reports, top-down methodologies have been developed and applied to identify finance, technology development and transfer, and capacity-building needs. Such reports have provided alternative methodologies to developing countries that have been adapted to national circumstances and contexts and used to determine national needs.

D. Challenges, opportunities and gaps in determining the needs of developing country Parties

1. Opportunities

55. There are several regional and global specialized institutions that can support countries in their needs identification process by providing expertise and data. Some of these institutions are United Nations agencies, to which countries have quick and easy access and which can be engaged with during the needs identification process to provide the required support.

56. A number of platforms have been established by various institutions, including United Nations agencies and MDBs. These platforms offer a good opportunity for developing countries to share their experience and good practices in the needs identification process. Most developing countries are already using these platforms to share their experience.

57. Several initiatives have been established that can help in the needs identification process. These initiatives include the establishment of emissions inventories, which provide some of the data and information that can facilitate the prioritization of sectors and activities as part of the country's climate change needs identification process.

2. Challenges

(a) Challenges experienced in the preparation of the report

58. In compiling the needs of developing country Parties from the various sources, efforts were made by the technical team to overcome challenges such as identifying reporting overlaps so as to avoid double counting in aggregating and presenting the data.

59. Nevertheless, the following challenges were encountered in collecting, categorizing, aggregating and presenting the data on needs:

(a) **Data inconsistencies**: the classification of sectors and subsectors is not uniform across data sources, including in different sources of information and reports submitted by the same Party. This increases the risk of double counting, as cost estimates may be given in one report by sector and in another report by activity, so the same activity may be captured and hence accounted for under the costs by sector. Issues related to the definitions of needs also introduce inconsistencies because needs are referred to as qualitative needs, investment needs or costs.

(b) **Data gaps**: gaps in the coverage of information on costed needs by sector or subsector pose a significant challenge. These gaps are particularly evident for adaptation needs, which, compared with cost estimates for mitigation, remain limited. Significant data gaps related to capacity-building needs remain; these are predominantly characterized in qualitative terms. Further, information on methodologies used in producing and communicating information on needs in national reports is, in many cases, not included in these reports. In addition, methodological assumptions, which in most cases are not stated, may impact the interpretation of the data. The needs are dynamically changing and may depend on different factors such as temperature scenarios,

mitigation pathways and adaptive capacity, extreme weather events, adverse effects of trade and economic barriers, and social factors such as poverty. Most reports, however, provide a snapshot of a Party's needs. It should also be noted that not all Parties have submitted reports.

(c) **Data interpretation**: when collecting, analysing and aggregating data and information on the needs of developing country Parties, best efforts have been made to ensure accuracy. When collecting and analysing the amounts of needs reported by developing country Parties in their national reports, different Parties apply their respective definitions and interpretations of needs. Needs may be reported as needs or activities needed to take climate action. Furthermore, costed needs may be determined in one national report but not in the subsequent report, without stating whether the same amounts of costed needs apply.

60. The following steps were undertaken to analyse, aggregate and present the data:

(a) Analysis of data gaps and identification of areas for improvement;
(b) Harmonization of data sets used for estimating the global total needs in order to minimize misalignment between information and data according to thematic areas, regions, sectors and time frames;
(c) Presentation of quantified data in ranges of estimates where possible, instead of aggregating the amounts to avoid possible data overlaps;
(d) Use of case studies to highlight good practices and lessons learned in determining needs.

(b) Challenges experienced by developing countries

61. Institutional coordination were highlighted as a major challenge in the needs determination process. The coordination challenge affected needs identification between sectors and between levels of governance, namely the local and national levels. Two of the identified drivers of limited coordination was the lack of specialized institutions within ministries with the mandate to spearhead climate change actions, and the involvement of ministries other than the environment ministry in climate change planning in the needs identification process.

62. While most countries have used methodologies to identify and report their needs both qualitatively and quantitatively, costing these needs has been a major challenge and therefore most of these needs do not have accompanying cost estimates. This challenge is particularly evident in deriving cost estimates for climate adaptation and enhancing resilience needs, and, in this context, deriving cost estimates for averting, minimizing and addressing loss and damage needs, since developing countries' adaptation actions cannot always be included in short-term projects, but rather require long-term interventions that are difficult to estimate in monetary terms.

3. Gaps

63. Developing countries have taken significant steps to improve their needs determination process but capacity gaps within lead institutions continue to hinder progress. These capacity gaps vary widely across countries and include the lack of qualified personnel to spearhead the needs identification process and the lack of institutional-level capacity.

64. Limited availability of granular data at the sector and subsector level constitutes one of the major gaps identified by developing countries. As a result, many developing countries provide cost estimates for overall needs rather than disaggregated by theme or sector.

65. The lack of specialized national institutions to spearhead the means of implementation under the Convention, such as technology development and transfer, and capacity-building, limits the ability of some developing countries to track needs continuously and identify additional and emerging needs.

66. Limited detailed guidance on the structure and content of reports submitted to the UNFCCC resulted in needs with varying levels of detail across countries. Where such guidance was available, for instance for TNAs, the needs were identified at a higher level of detail compared with needs communicated in other national reports.

4. Insights into determining needs using available resources: country case studies and experience

67. Country case studies have shown that the needs identification process provides an opportunity for countries to translate their needs into investment opportunities and climate actions, including by using

existing support mechanisms to prioritize and cost identified needs and turn needs into project ideas for support. For example, through the TNA process, some countries identified technology support needs and submitted a request for technology assistance to formulate project ideas related to technology development and transfer.

68. Costing adaptation and mitigation needs for action is becoming a crucial area of work at the national level in order to better identify gaps where financial support is needed and ways to leverage public and private resources.

5. Co-benefits related to addressing the needs of developing country Parties, such as in relation to the Sustainable Development Goals, disaster risk reduction and the Addis Ababa Action Agenda

69. For most countries, climate change needs are aligned with the targets set out in the 2030 Agenda for Sustainable Development. As the SDGs are ideally indivisible, all developing country Parties covered in this report are taking action to address SDG 13 that relates to taking action to address climate change, and SDG 13 affects all the other SDGs. Overall, the needs identified by developing countries touch on all SDGs, with 75 per cent of NDCs having linkages to SDGs 2, 6, 7, 8, 9, 11, 12, 13, 15 and 17.

70. In their national reports, some developing country Parties refer to the Addis Ababa Action Agenda provision for mobilizing and aligning local resources for climate action. This is particularly evident in countries that capture their climate action budgets under the national budgeting process.

V. Recommendations

71. The SCF invites the COP and the CMA to consider the following recommendations:

(a) *Encourage* developing country Parties and climate finance providers, as well as multilateral and financial institutions, private finance data providers and other relevant institutions, to enhance the availability of granular, country-level data on needs related to the implementation of the Convention and the Paris Agreement with a view to addressing existing data gaps;

(b) *Encourage* developing country Parties to share best practices on determining needs, including regarding to the institutional capacity conducive to determining needs;

(c) *Encourage* developing country Parties to provide, where possible, information on needs related to:
   (i) Gender-responsive climate action and the needs of indigenous peoples and vulnerable groups;
   (ii) Preparation of national reports to the UNFCCC, including reporting on the activities contained therein;
   (iii) Addressing and mitigating risks, including physical and transitional risks;
   (iv) Energy poverty as it relates to sustainable development;
   (v) Methodologies employed in the determination of the needs in their national reports to the UNFCCC, including, in accordance with reporting guidelines and where available, quantified data on needs;

(d) *Request* the SCF, in preparing future NDRs, to present available data and information on needs related to the recommendations referred to in paragraph 71(c) above;

(e) *Invite* the operating entities of the Financial Mechanism, United Nations agencies, multilateral and bilateral financial institutions and other relevant institutions to make use of the information contained in the first NDR when supporting developing country Parties in identifying and costing needs;

(f) *Invite* the operating entities of the Financial Mechanism to revise templates and guidance for developing countries when supporting their processes in identifying their needs with a view to enhancing availability of granular information on qualitative and quantitative needs;

(g) *Encourage* the operating entities of the Financial Mechanism, United Nations agencies, multilateral and bilateral financial institutions and other relevant institutions to make available further information on methodologies related to determining and costing needs, especially for adaptation needs and incremental costs;

(h) *Encourage* developing country Parties to consider the insights on methodologies identified in the first NDR when costing and determining needs;

(i) *Encourage* developing country Parties to take advantage of available resources through the operating entities of the Financial Mechanism, as well as other multilateral and bilateral actors, to strengthen institutional capacity for identifying and costing their needs in relation to implementing the Convention and the Paris Agreement;

(j) *Request* the SCF to engage with public and private financial institutions and to disseminate the findings of the first NDR;

(k) *Invite* UNFCCC constituted bodies, in particular the Paris Committee on Capacity-building and the Adaptation Committee, to consider the insights identified in the first NDR when implementing their respective work plans;

(l) *Encourage* Parties, multilateral and financial institutions, academia, methodology developers, research institutions and other relevant actors to continue to develop methodologies for the determination of adaptation and resilience enhancement needs and, in this context, needs related to averting, minimizing and addressing loss and damage;

(m) *Encourage* the operating entities of the Financial Mechanism, United Nations agencies, multilateral and bilateral financial institutions and other relevant institutions to provide financial and technical support to developing countries for updating the reporting of their qualitative and quantitative information and data on needs to be considered in subsequent NDRs, as appropriate;

(n) *Encourage* all actors, when determining needs for implementing the Convention and the Paris Agreement, to highlight linkages to the implementation of the 2030 Agenda for Sustainable Development and application of the Addis Ababa Action Agenda.

TABLE OF CONTENTS

Chapter I

Mandate and scope

1.1 Mandate stemming from decision 4/CP.24, paragraph 10

1. The COP, by decision 4/CP.24, paragraph 13, requested the SCF to prepare, every four years, an NDR for consideration by the COP, starting at COP 26, and the CMA, starting at CMA 3 (November 2020).

2. The COP also requested the SCF, in preparing the report, to collaborate, as appropriate, with the operating entities of the Financial Mechanism, the subsidiary and constituted bodies, multilateral and bilateral channels, and observer organizations.[14]

3. COP 25 and CMA 2 encouraged the SCF to present, to the extent possible, disaggregated information in relation to, inter alia, mapping data availability and gaps by sector, assessing climate finance flows and presenting information on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement.[15] In the same decision, the COP 25 and CMA 2 encouraged the SCF to build on, in implementing its strategic outreach plan, existing efforts to reach out to developing country Parties and relevant developing country stakeholders when generating data and information for the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement.[16]

1.1.1 Related mandates

4. In preparing this first NDR, the SCF took into consideration previous mandates related to the needs of developing country Parties that are relevant in the context of paragraph 2 above, including the following:

(a) COP mandates related to arrangements between the COP and the operating entities of the Financial Mechanism, including the memorandum of understanding between the COP and the GEF Council,[17] and arrangements between the COP and the GCF;[18]

(b) The COP 23 request for the secretariat to explore ways and means to assist developing countries in assessing their needs and priorities, in a country-

14) Decision 4/CP.24, para. 14.

15) Decision 11/CP.25, para. 9 and decision 5/CMA.2, para. 9.

16) Decision 11/CP.25, para. 12 and decision 5/CMA.2, para. 12.

17) Decision 12/CP.2, annex, para. 9: "In accordance with Article 11.3(d) of the Convention, which calls for arrangements to determine in a predictable and identifiable manner the amount of funding necessary and available for the implementation of the Convention and the conditions under which that amount shall be periodically reviewed, the COP and the Council shall jointly determine the aggregate GEF funding requirements for the purpose of the Convention. Procedures to facilitate such a joint determination will be developed by the COP and the Council and annexed to this Memorandum".

18) Decision 5/CP.19, annex, para. 17: "In accordance with Article 11, paragraph 3(d), of the Convention, which calls for arrangements to determine in a predictable and identifiable manner the amount of funding necessary and available for the implementation of the Convention, and the conditions under which that amount shall be periodically reviewed: a) The COP will make assessments of the amount of funds that are necessary to assist developing countries in implementing the Convention, in order to help inform resource mobilization by the GCF".

driven manner, including technological and capacity-building needs, and in translating climate finance into action;[19]

(c) The SBI 28 request in the context of the fourth review of the Financial Mechanism, for the secretariat to provide, upon request, information to non-Annex I Parties on the assessment of financing needs to implement mitigation and adaptation measures.[20]

5. The constituted bodies of the Convention, that also serve the Paris Agreement, have mandates relating to the assessments of the needs of developing countries. The outcomes of the work of the constituted bodies, such as in the development and provision of methodologies for national reporting and the compilation and analysis of these reports, served as useful inputs in this report.

6. The Adaptation Committee considered methodologies for assessing adaptation needs, including finance, capacity-building and technological support, in the preparation of national adaptation plans and implementation. Both the LDC Expert Group and the Adaptation Committee NAP task force also considered gaps and needs related to the process to formulate and implement NAPs, as well as, how to address them.

The PCCB conducted a national-level pilot exercise on assessing capacity gaps and needs related to NDC implementation supplemented with insights gained through desk research and interviews.

7. Given the mandates above, the objectives of the first NDR are to:

(a) Provide an overview of the qualitative and quantitative needs of developing country Parties related to implementing the Convention and the Paris Agreement;

(b) Map out available tools and methodologies for determining and prioritizing needs, including sector-specific methodologies and tools, and explore the advantages and challenges experienced in their application;

(c) Illustrate how country-owned and country-led processes and approaches in determining needs lead to the identification of data and information gaps, good practices and lessons learned in determining the needs of developing country Parties;

(d) Facilitate understanding of how determining needs contributes to increasing ambition in implementing the Convention and the Paris Agreement.

19) Decision 6/CP.23, para 10, requested the secretariat, in collaboration with the operating entities of the Financial Mechanism, United Nations agencies and bilateral, regional and other multilateral channels, to explore ways and means to assist developing country Parties in assessing their needs and priorities, in a country-driven manner, including technological and capacity-building needs, and in translating climate finance needs into action. In response to this request, the secretariat developed the NBF project, which aims to facilitate access to and mobilization of climate finance and investment, in supporting the needs identified by developing countries for implementing their priority projects and programmes as outlined in their NDCs, NAPs and other relevant national policies and strategies.

20) FCCC/SBI/2008/8, para 30. In fulfilling this request, the secretariat designed and implemented the National Economic, Environment and Development Study for Climate Change Project. The project delivered 11 country study reports, an initial summary report, and a synthesis report. Information available at https://unfccc.int/topics/climate-finance/workstreams/determination-of-the-needs-of-developing-country-parties-related-to-implementing-the-convention-and/national-economic-environment-and-development-study-needs-for-climate-change-project.

1.2 Scope

8. The first NDR comprises two parts:

(a) An executive summary, prepared by the SCF, which is included in the annual report of the SCF to COP 26 and CMA 3;
(b) A technical report, prepared by external experts under the guidance of the SCF, consisting of an analysis of existing reports and available data.

9. Chapter 1 introduces the report by outlining the steps taken by the SCF in preparing it, including milestones and outputs. The chapter describes the sources of information, time frames, coverage of needs and the process of categorizing, aggregating and presenting the collected information and data.

10. Chapter 2 maps the information and data available on the needs of developing country Parties and gaps. First, it provides an overview of the needs of developing country Parties, specifically national reports submitted to the UNFCCC, as well as an overview of needs derived from regional and global reports. In characterizing the needs of developing country Parties, the chapter qualifies findings on overall needs, followed by the needs with associated financial information or estimated costs, as a subset of overall needs. Needs are presented in relation to regions, thematic areas, means of implementation, sectors and subsectors.

11. Chapter 3 provides an overview of the processes and approaches used in determining the needs of developing countries as provided in their national reports, including the types of institutional arrangements used to derive such estimates. It also provides examples of the processes and approaches used in deriving estimates of needs included in regional and global reports. Furthermore, the chapter provides an overview of the actors involved in determining needs. The report does not aim to prescribe the processes and approaches countries and other stakeholders should follow when determining needs.

12. Chapter 4 introduces methodologies for determining needs and their underlying assumptions. The chapter presents information on the methodologies commonly used by developing countries to determine needs, including financial needs. The chapter also introduces regional and international organizations' methodological approaches to determining and characterizing needs related to mitigation and adaptation actions.

13. Chapter 5 outlines opportunities, gaps and challenges in determining the needs of developing country Parties.

1.2.1 Sources of information and data, time frames and coverage

14. The report provides an overview of the needs of developing country Parties to address climate change in accordance with the Convention and the Paris Agreement, based on the data and information available at the national, regional and global level. Thus, the information used and presented in this report is a reflection of national, regional and global reports. It aims to map methodologies and approaches used in determining needs, as well as opportunities, gaps and challenges.

15. The key sources of information include the following: ACs, BURs, LEDS, NAPs, NAPAs, NCs, NDCs, TAPs and TNAs.[21] Another source of information is the submissions received from Parties and non-Party stakeholders in response to the call for evidence issued by the SCF.[22,23.]

16. To the extent possible and based on available information, the technical team:

(a) Mapped sources of information available;
(b) Categorized needs according to time frames, regions, thematic areas, means of implementation, sectors and subsectors;
(c) Harmonized data and information according to time frames, regions, thematic areas, means of implementation, sectors and subsectors;
(d) Conducted data analysis and presented findings according to regions, thematic areas, means of implementation, sectors and subsectors.

17. Further sources of information and data include regional and global reports that contain information on the needs of developing countries. Sources of information included reports with the

21) For more information on the mandates, scope and reporting interval for the various reports, please refer to Annex E.

22) Available at: https://unfccc.int/sites/default/files/resource/Call_for_evidence_2020NeedsReport.pdf. The call was further extended until 30 October 2020.

23) As at October 2020, 34 submissions had been received. All submissions are available at https://unfccc.int/topics/climate-finance/workstreams/needs-report/repository-of-information-on-the-needs-of-developing-country-parties.

© Getty Images

most recent data available covering regions, thematic areas, means of implementation and sectors. Where possible, information and analysis related to needs for investment or costs of needs, as well as how needs differ, were also included.

Time frame

18. The time frames are based on the information countries presented in their national reports. They vary from short-term (less than five years, e.g. project- or programme-level data) to medium-term (5 to 10 years, e.g. in NCs) and long-term (more than 10 years, e.g. in NDCs). Time frames based on information from regional or global reports are reflected as per the underlying reports.

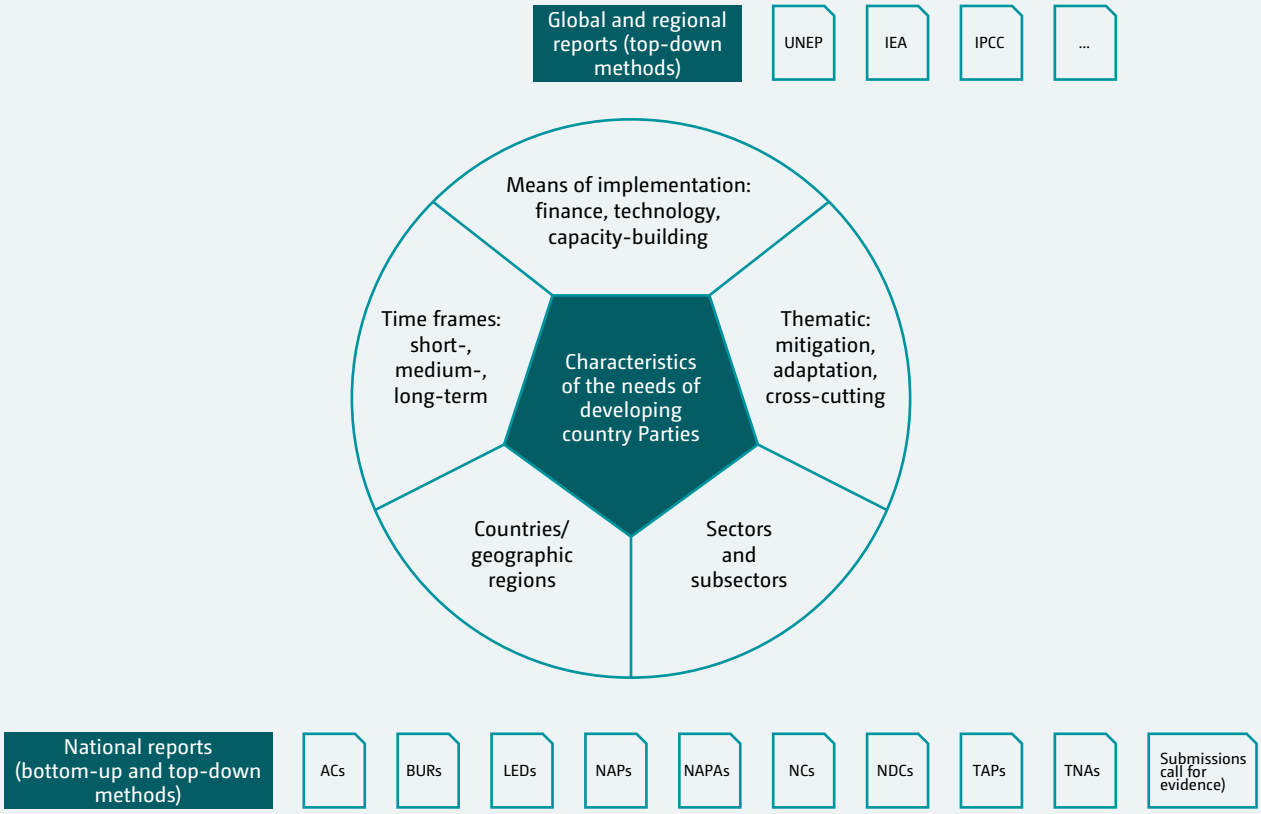
Coverage

19. In accordance with decision 4/CP.24, the report covers the needs of developing countries[24] in the African States, Asia-Pacific States, Eastern European States, Latin America and Caribbean States, and Western European and other States. Annex A provides a list of country and institution groupings used in this report. As reported by countries, the report covers the needs relating to adaptation and mitigation and to finance, technology development and transfer and capacity-building. The national reports and the submissions received in response to the call for evidence issued by the SCF also provided information on the needs of developing countries relating to energy, transport, waste, industry, water, agriculture, health, coastal zones and forestry. Where available, information and data on subsectors are presented.

24) For the purpose of the first report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement, various data sources are used to illustrate needs of developing country Parties, without prejudice to the meaning of this term in the context of the Convention and the Paris Agreement, including but not limited to Parties not included in Annex I to the Convention and other classifications used in regional and global reports.

Figure 1.1

Approach taken in organizing information and data by source



1.2.2 Approach to developing the report

20. The technical work comprised a review of literature and sources of available information and data, and quantitative and qualitative data collection and analysis, complemented by outreach activities. Data and information were systematically collected by the technical team under the guidance of the SCF co-facilitators for the first NDR.

21. The SCF periodically considered the outputs of the technical team and the input derived from regional meetings and provided guidance on the development of the report, including during conference calls and in-person meetings.

Sources

22. Information on the needs of developing country Parties was disaggregated by gender, indigenous peoples and people that are particularly vulnerable to the adverse effects of climate change as provided for in the Convention (hereinafter referred to as vulnerable groups), where this information was available under each chapter.

23. This report includes all needs that are expressed in a quantitative (hereinafter referred to as costed needs) or (hereinafter referred to as needs) qualitative manner. Quantitative information was compiled from lists of projects and economic modelling in reports at the national, regional and global level and other sources. Qualitative information on needs was derived from descriptions of planned activities, strategic directions, national priorities and action plans in the source literature.

24. Unless otherwise specified in national reports, this report considered that reported costs reflected full costs for stated needs, rather than the incremental cost for climate change actions. As there are no guidelines

under the Convention on reporting the financial needs of developing countries, the quantified needs were estimated by developing countries using different time frames, and countries often did not state whether the amounts were in present or constant value. This report takes the estimated costs of reported needs at face value; that is, as stated in the national report without considering the net present value and the potential of inflation.

25. The following steps were undertaken to analyse, aggregate and present the data:

(a) Analysis of data gaps and identification of areas for improvement;
(b) Harmonization of data sets used for estimating the global total needs to minimize misalignment between information and data according to thematic areas, regions, sectors and time frames;
(c) Presentation of quantified data in ranges of estimates where possible, instead of aggregating the amounts to avoid possible data overlaps;
(d) Use of case studies to highlight good practices and lessons learned in determining needs

1.2.3 Information and data collection outreach

26. In addition to collecting information and data from various reports and conducting a literature review, the SCF undertook a number of outreach activities with a view to gathering further inputs on the needs and priorities of developing countries. These activities included:

(a) Consultations during the fiftieth session of the subsidiary bodies[25] conducted by the SCF co-facilitators of the report with groups of Parties,[26] and a meeting to share information, including available data and reports related to assessing and determining the needs of developing countries;[27]
(b) An expert meeting attended by SCF members on assisting developing countries to assess and determine their needs;[28]
(c) A call for evidence to gather inputs on the needs and priorities of developing countries;
(d) A series of regional outreach webinars conducted with country representatives to gather data and information on their climate needs and to seek guidance in the preparation of the report.[29]

25) SB 50 took place from 17 to 27 June 2019 in Bonn, Germany.

26) Consultations were held with the following negotiating groups to gather views on expectations of the report, as well as on available data and information on the needs of developing countries as contained in national reports, policies, strategies and other reference material: African Group, Argentina, Brazil and Uruguay, Alliance of Latin America and the Caribbean, Alliance of Small Island States, Arab Group, Environmental Integrity Group, European Union, the least developed countries, and the Umbrella Group. As the meeting with the Like-minded Developing Countries was not convened, it was agreed that this group could submit its views in writing to the co-facilitators.

27) This meeting was attended by 30 potential collaborators and data providers representing Parties, bilateral and multilateral agencies, multilateral development banks, United Nations programmes, think tanks and NGOs.

28) The experts meeting took place on 10 and 11 July 2019, in Manila. A summary of the meeting is available at https://unfccc.int/sites/default/files/resource/ExpertsMeeting_Summary.pdf.

29) The webinars for Africa and Eastern Europe took place on 17 September 2020, for Asia-Pacific on 14 October 2020 and for Latin America and the Caribbean on 24 September 2020, respectively.

Chapter II

Overview of the needs of developing country Parties

2.1 Key findings

27. The needs identified and articulated by developing country Parties across the nine types of national report encompass a wide range of financial, technology development and transfer, and capacity-building needs. The level of detail in the information provided varies in terms of the description of needs and their associated costs, if specified. While some Parties express costed needs for adaptation or mitigation purposes, other communicate needs at the activity or sector level.

28. As at 31 May 2021, NDCs from 153 Parties included 4,274 needs, with 1,782 costed needs identified across 78 NDCs, cumulatively amounting to USD 5.8–5.9 trillion until to 2030. Of this amount, USD 502 billion is identified as needs requiring international sources of finance and USD 112 billion as sourced from domestic finance. For 89 per cent of the costed needs, information was not provided on possible sources of finance. Among the national reports, NCs from 149 Parties present the highest number (6,990) of identified needs, of which 1,137 costed needs cumulatively amount to USD 8.8–8.9 trillion, with 5 per cent of the costed needs distributed across 45 NCs and 95 per cent in 1 NC. BURs from 62 Parties indicated 2,044 needs, of which 535 needs are costed, cumulatively amounting to USD 11.5 trillion, with 5 per cent distributed across 60 BURs and 95 per cent across 2 BURs, thereby representing the highest amount of costed needs identified across the nine national reports. These figures should be seen in light of the size and nature of Parties' economy and the scale of impacts.

29. Although developing country Parties identified more adaptation than mitigation needs, more costs were identified for the latter. This may not imply that mitigation needs are greater, but rather be due to the lack of available data, tools and capacity to assess adaptation needs. Adaptation needs focus on agriculture, water, and disaster prevention and preparedness. The main mitigation needs focus on the energy, transportation, land use and forestry and waste and sanitation sectors.

30. Information and data on the needs of developing country Parties are also available from regional and global reports. For the mitigation needs of developing country Parties, these reports use a mix of climate economic modelling for scenarios of below 2 °C, ranging from USD 2.4 trillion to USD 4.7 trillion in annual energy-related investment needs globally; investment opportunities based on stated national plans and targets including and beyond NDCs, ranging from USD 23.8 trillion to USD 29.4 trillion for emerging markets from 2016 to 2030; and investment estimates for achieving conditional NDC targets using carbon prices (for example, USD 715 billion in Africa.

© Unsplash

31. Regional and global reports provide estimates related to adaptation and resilience. Costs based on bottom-up national and sector-based studies (ranging from USD 140 billion to USD 300 billion annually by 2030) measuring impacts to GDP (for example ranging from USD 289.2 billion to USD 440.5 billion up to 2030 in Africa) and the incremental investment needed to upgrade or retrofit infrastructure stock (ranging from USD 11 billion to USD 670 billion in annual incremental costs) are most prevalent.

32. The information and data generated from the national, regional and global reports cannot be compared with each other as the reports have different time frames, objectives and scopes. However, all of the reports may be viewed as complementary in offering different insights, granularity and processes and approaches for identifying needs.

2.2 Information and data from national reports

33. National reports submitted by developing country Parties as part of the UNFCCC process contain information on their needs related to implementing the Convention and the Paris Agreement. There are nine types of national report, which serve different purposes under the Convention and the Paris Agreement, with reported needs varying in terms of thematic and sectoral coverage, time frame, and granularity of detail. In total, 563 documents were included in the analysis for the first NDR.[30] Reports that provide perspectives and information on the needs of developing countries to meet the goals of the Convention and the Paris Agreement at the regional and global level are presented in section 2.3 below.

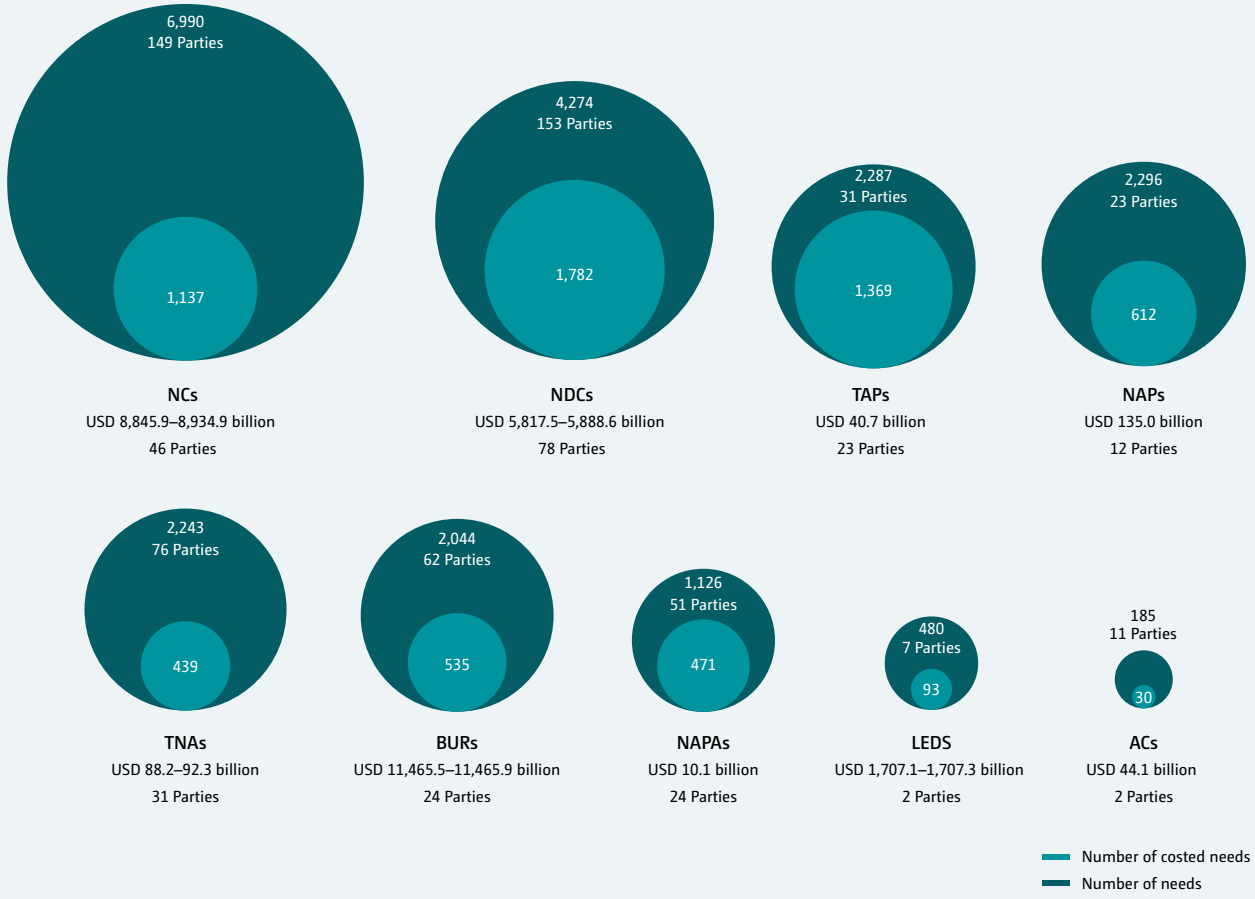
34. Figure 2.1 provides an overview of the articulation of the needs of developing country Parties, including overall costed needs, across the nine types of national report submitted by developing country Parties to the UNFCCC.[31] The overall costed needs by type of report are based on the information on activities with associated costs included in the corresponding individual national reports. The needs included in national reports are identified using a top-down approach (i.e. needs that are typically estimated using economy-wide or sectoral modelling techniques) or a bottom-up approach (i.e. needs that are typically identified from a project pipeline). Developing country Parties periodically update their national reports submitted to the UNFCCC, reflecting changing circumstances and improvements in their data-collection processes and analysis. Therefore, data and information on needs may not be exhaustive as the needs are dynamically changing.

30) Only the most recent submissions to the UNFCCC were used in the analysis as Parties regularly update information on their needs to reflect changing circumstances. To avoid double counting where Parties may have provided the same information in different reports (e.g. BURs and NDCs), each type of report is treated separately, without aggregation across them.

31) Needs are catalogued in the analysis at the most granular level where information is listed (i.e. a project or activity expressed as a need by a developing country is counted as a single activity; if activity-level information was not provided, needs are counted at the sector level; if sector-level information was not provided, needs are counted at the thematic level, etc.). Depending on the nature of the report, it is possible that the priorities and programmes consist of multiple projects and action items. See chap. 1 of the first NDR for details on the scope of the quantitative and qualitative information collected from national reports.

Figure 2.1

Overview of articulation of needs including costed needs by type of national report submitted to the UNFCCC



Notes: Ranges of costs included where available.

2.2.1 Insights from quantitative data on needs

35. Across all nine types of national reports presented in figure 2.1 and table 2.1 below, the NCs, NDCs and BURs contain the highest number of identified needs. NCs represent the greatest number of needs, with 6,990 needs identified in 149 NCs. Of these, 1,137 needs, identified in 46 NCs, were costed, cumulatively amounting to USD 8.8–8.9 trillion, of which 95 per cent represented costed needs in one NC and 5 per cent in 45 NCs. NDCs include 4,274 needs, of which 1,782 needs were costed in 78 NDCs (42 per cent), cumulatively amounting to USD 5.8–5.9 trillion up to 2030. While BURs cover the highest amount of costed needs, 95 per cent of this amount has been identified in two BURs. These three types of national reports have the highest country coverage in terms of articulation of the number of needs and typically cover all thematic areas of climate action. Compared to BURs, NCs and NDCs, other reports that focus on either adaptation (ACs, NAPs and NAPAs,) or technology development and transfer (TAPs and TNAs), overall include less information on needs. Furthermore, some countries have only recently begun to submit LEDS to the UNFCCC, and only in two cases with identified costed needs. The underlying country-level amounts by type of report presented in table 2.1 are included in Annex C.

36. **Thematic distribution of costed needs:** Costed needs represent a mix of total and incremental costs or investment needs, whether broken down by international or domestic sources or whether such breakdown is unspecified. As shown in table 2.1, cumulatively, identified costed mitigation needs tend to be larger than costed adaptation needs across the reports that cover all

Table 2.1

Overview of sources of reported costed needs of developing countries by type of national report submitted to the UNFCCC

	Costed needs (USD billion)				
Report	Total	Mitigation	Adaptation	Cross-cutting	Other
ACs	44.10 (100%)	–	44.10 (100%)	–	–
BURs	11,465.53–11,465.90 (100%)	5,286.94–5,287.31 (46%)	3,628.81 (32%)	2,550.01 (22%)	–
LEDS	1,707.15–1,707.35 (100%)	1,407.15–1,407.34 (82%)	300.00 (18%)	–	–
NAPs	135.02–135.03 (100%)	–	135.02 (100%)	–	–
NAPAs	10.05 (100%)	–	10.05 (100%)	–	–
NCs	8,845.85–8,934.94 (100%)	5,019.30–5,033.83 (56-57%)	3,812.06–3,882.07 (43%)	2.23 (>0%)	12.25–16.81 (>0%)
NDCs	5,817.48–5,888.56 (100%)	2,156.05–2,156.13 (37%)	764.24–835.24 (13–14%)	2,893.39 (49–50%)	3.81 (>0%)
TAPs	40.74 (100%)	21.97 (54%)	18.76 (46%)	–	0.01 (>0%)
TNAs	88.24–92.33 (100%)	30.33–34.33 (34–37%)	57.90–57.98 (63–68%)	0.01 (>0%)	–

Notes: Ranges of costs included where available.

thematic areas such as BURs, NCs and NDCs. The overall amount of costed adaptation needs is comparable with the overall amount of costed mitigation needs expressed in NCs (43 and 56–57 per cent, respectively). In the case of NDCs, the overall identified costed mitigation and adaptation needs (50 per cent) are comparable to the amount of costed cross-cutting needs (50 per cent), but it is worth noting that the costed needs expressed as cross-cutting nearly all originate from just one NDC. Although some developing countries provided information on costed needs for mitigation and adaptation by sector and subsector, this information was not provided across all reports. Therefore, it was not possible to provide a comprehensive and accurate overall amount of costed needs by sector and subsector in the first NDR.

37. **International–domestic distribution:** National reports do not always provide a distinction between sources of domestic and international funding sought to address the expressed needs. Furthermore, information on the number of costed needs is not always distinctly presented by source of funding across all types of national reports. Therefore, this first NDR, does not provide a break-down by source. Nevertheless, figure 2.2 above provides an illustrative example of information related to sources of funding for cumulative costed mitigation and adaptation needs, as well as unquantified (unspecified) needs expressed in NDCs.

38. **Regional distribution of costed needs:** Available information related to costed needs varies across regions (see table 2.2). African countries included 1,529 needs in their NDCs, of which 874 were costed, amounting to USD 2.5 trillion. The costed needs expressed in the NDCs of Djibouti, Ethiopia, Kenya, Mali, Morocco, Senegal, South Africa and Tunisia are the highest compared to NDCs of other African countries. These countries expressed their needs with further details such as, by listing their projects or with estimations of their future needs. However, most needs were expressed qualitatively, as was also the case in the analysis of the African Development Bank (AfDB, 2019).

39. NDCs of countries in the Asia-Pacific region include 1,677 needs, of which 630 needs were costed, cumulatively amounting to USD 3.2–3.3 trillion. Some countries in Asia-Pacific such as India, Iran, Iraq, Kiribati, Nepal and

Figure 2.2

Illustration of needs in NDCs by domestic and international sources (USD billion)

Table 2.2

Needs expressed in Nationally Determined Contributions by region

Region	Number of expressed needs	Number of expressed needs with financial information (i.e. costed needs)	Costed needs based on available financial information (USD billion)
African States	1,529	874	2,459.56–2,460.56
Asia-Pacific States	1,677	630	3,180.39–3,250.39
Eastern European States	282	112	9.36
Latin American and Caribbean States	771	166	168.18–168.26
Western European and other States	15	–	–

Notes: Ranges of costs included where available.

Pakistan also provided detailed information on needs expressed in their NDCs. Of the 771 needs expressed in the NDCs of countries in the Latin America and the Caribbean region, 166 NDCs include costed needs, cumulatively amounting to USD 168.2-168.3 billion, of which almost 60 per cent was in one NDC. Some countries that costed their needs include Antigua and Barbuda, Brazil, Cuba, the Dominican Republic and Haiti.

40. NDCs of developing countries from the Eastern European region include 282 needs, of which 112 were costed, cumulatively amounting to USD 9.36 billion.

41. As noted in paragraph 34 above, needs expressed in national reports are dynamically changing and, therefore, data and information thereon may not be exhaustive. While the number of needs and costed needs communicated in national reports is lower for some regions than others, this does not mean that those regions have no or fewer needs. Rather, this may be due to lack of available data, tools and capacity got determining and costing needs. Therefore, the number of needs and costed needs compiled from national reports available at the time of preparation of the first NDR should not be used to draw comparisons of the actual needs across regions.

Table 2.3

Costed needs expressed in Nationally Determined Contributions by region and thematic area

Region	Costed needs in (USD billion)			
	Mitigation	Adaptation	Cross-cutting	Other
African States	1,789.24 (73%)	276.92–277.92 (11%)	393.38 (16%)	0.02 (>0%)
Asia-Pacific States	225.47 (7%)	453.98–523.98 (14-16%)	2,500.01 (77-79%)	0.92 (>0%)
Eastern European States	2.11 (23%)	4.38 (47%)	–	2.86 (31%)
Latin America and the Caribbean States	139.23 (83%)	28.95 (17%)	–	–
Western European and other States	–	–	–	–

Notes: Ranges of costs included where available.

42. Considering the thematic distribution among the five regions (see table 2.3), mitigation needs constitute the largest share of costed needs in the Africa and Latin America and the Caribbean regions (73 per cent and 83 per cent, respectively). Of the costed mitigation needs in the Africa region, 56 per cent was identified and costed in one NDC. Similarly, the largest share (71 per cent) of mitigation needs in the Latin America and the Caribbean region was identified in one NDC.

43. In most regions, adaptation needs constitute less than 20 per cent of the costed needs, except in Eastern European States where almost half (47 per cent) of the costed needs correspond to adaptation. However, it must be noted that this may not necessarily suggest that mitigation needs are greater than adaptation needs, but reflect more the lack of available data, tools and capacity to assess adaptation needs (see chapter 4).

44. Cross-cutting needs are costed in two regions, Africa and Asia-Pacific. With 77–79 per cent, cross-cutting needs presents the highest share of costed needs in the Asia-Pacific region, of which 99 per cent was identified in one NDC. Costed cross-cutting needs constitute 16 per cent of the Africa region's needs.

45. The distribution of needs in the NDCs across countries and regions in figure 2.3 below shows that the expressed needs for mitigation are spread out over more countries as compared with the needs for adaptation. Some Parties reported information on potential needs related to averting, minimizing and addressing loss and damage, either through specific adaptation activities that include objectives related to averting, minimizing and addressing loss and damage; referenced damage incurred owing to recent climate-related events such as droughts and severe weather; or modelled potential future impacts of climate on GDP or economic losses in a given year (e.g. 2030 or 2050). The information was also reported in the context of national circumstances, climate impacts and/or needs depending on the reporting Party. The information is also reported in the context of national circumstances, climate impacts and/or needs depending on the Party reporting. For example, a few countries, namely Djibouti, the Dominican Republic, Papua New Guinea, the Republic of Moldova, Sri Lanka and Timor-Leste provided information on needs related to averting, minimizing and addressing loss and damage in their NDCs. Countries also use other types of national reports to provide such information. Where possible, such data is captured. However, given different interpretations, it is not possible for this report to provide a comprehensive and accurate account of needs related to averting, minimizing and addressing loss and damage. in the.

46. The needs of LDCs were expressed in more detail in certain reporting types than in others. For example, the NDCs included more information relating to mitigation (52 per cent). LDCs provided limited information in BURs and NCs; 13 per cent of expressed needs in BURs come from the LDCs, while in NCs, 34 per cent of expressed needs come from the LDCs, of which 13 per cent include financial information.

47. A number of the LDCs expressed their needs for adaptation support through TNAs and NAPAs: Angola,

Burundi, Cambodia, Comoros, Ethiopia, Guinea-Bissau, Rwanda, Sao Tome and Principe, Sierra Leone, South Sudan, Sudan, Tuvalu, the United Republic of Tanzania and Zambia. They expressed some needs equally, namely financial support, technical assistance and support for monitoring, reporting, verification and evaluation.

48. **SIDS express their needs mainly in NCs, NDCs, NAPs and TNAs**. Half of the expressed needs with financial information in NAPs were from SIDS. However, the monetary value of these needs is about 1 per cent of the total monetary value of requested needs. In NDCs and BURs, the needs expressed by SIDS for mitigation and adaptation were fairly equal although in NCs needs for adaptation were almost double the needs for mitigation.

49. Most needs across all types of reports are expressed in cumulative terms and over several or many years, with varying time frames. For example, most LEDS and TAPs indicated time frames for the needed activities with 80 and 74 per cent, respectively, of the total needed activities determined in terms of the project time frames (short-, medium- or long-term).

2.2.2 Insights from qualitative data on needs

50. **When the distribution of the number of needs by thematic area is considered, developing countries provided more information on their needs related to adaptation across the nine types of report.** Overall, needs related to adaptation are mentioned more often than mitigation in all report types, except in the cases of BURs and LEDS, indicating greater attention to supporting developing countries' expressed adaptation needs. Notably, the number of expressed adaptation-specific needs is also marginally higher than the number of mitigation-specific needs expressed in national reports with broad thematic coverage of needs such as in NCs and NDCs. For example, as shown in figure 2.3 a above, NDCs include 1,991 needs for adaptation and 1,956 for mitigation.

51. **Regional distribution of the number of expressed needs:** As shown in figure 2.3 b above, the number of expressed needs across the nine national report types is considered, developing country Parties in the Africa and Asia-Pacific regions identified comparable numbers of needs across the national reports with broad thematic and sectoral coverage such as BURs, NCs and NDCs, comparable with the Latin America and Caribbean region only in the case of BURs. Developing country Parties in the Asia-Pacific region used NAPs and TAPs to further specify adaptation needs, as more than half of the needs identified in NAPs and TAPs were from this region. Developing country Parties in the Latin America and Caribbean, and Eastern European regions expressed more needs in their NCs than in other national reports. Latin American and Caribbean Parties expressed a considerable number of adaptation needs in adaptation-specific national reports (e.g. ACs and NAPs) when compared with the overall number of needs expressed in their BURs and NDCs. Developing country Parties in the African region expressed more needs through TNAs compared with other regions, reporting 993 needs compared with the 642 needs identified by Parties in the Asia-Pacific region.

Distribution by means of implementation

52. **Means of implementation distribution of the number of expressed needs:** When identified needs are analysed on the basis of means of implementation, the qualitative data show a significant prevalence of capacity-building and technology development and transfer needs, which may, in part be due to the resources developing countries can access to support the identification of these needs. The number of capacity-building needs is higher than finance needs and technology development and transfer needs identified in the nine national report types except for TNAs (see figure 2.3c). Capacity-building needs expressed across the national reports typically cover areas such as research, training and education, awareness-raising, institutional strengthening and coordination, and policy development.

Sectoral and subsectoral distribution

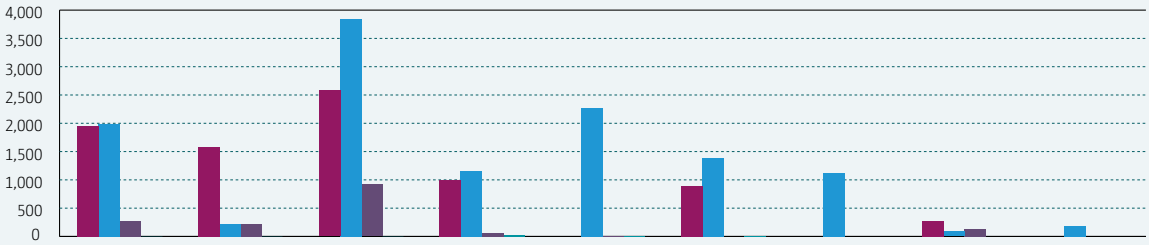
53. On the basis of the number of mitigation needs expressed across the nine national report types, energy is the lead sector for climate change mitigation actions, followed by land use and forestry, transport, agriculture, and waste and sanitation

54. When considering mitigation needs by sector and subsector, the nine types of national report show that most needs in the **energy sector** relate to requests for support for the energy efficiency and renewable energy subsectors, albeit with some variation between them. In NDCs, needs for renewable energy development were identified almost twice as frequently as those for energy efficiency (399 and 261, respectively) but the total nominal value of energy efficiency projects was 1.5 times larger than that of renewable energy projects (USD 377.22 billion and USD 198.08 billion, respectively). In BURs and NCs, more needs related to renewable energy than to energy efficiency were identified. TNAs included larger variation of needs, including development of natural gas, phasing-out of inefficient subsidies, exploration of carbon capture and storage and development of efficient use of coal.

Figure 2.3

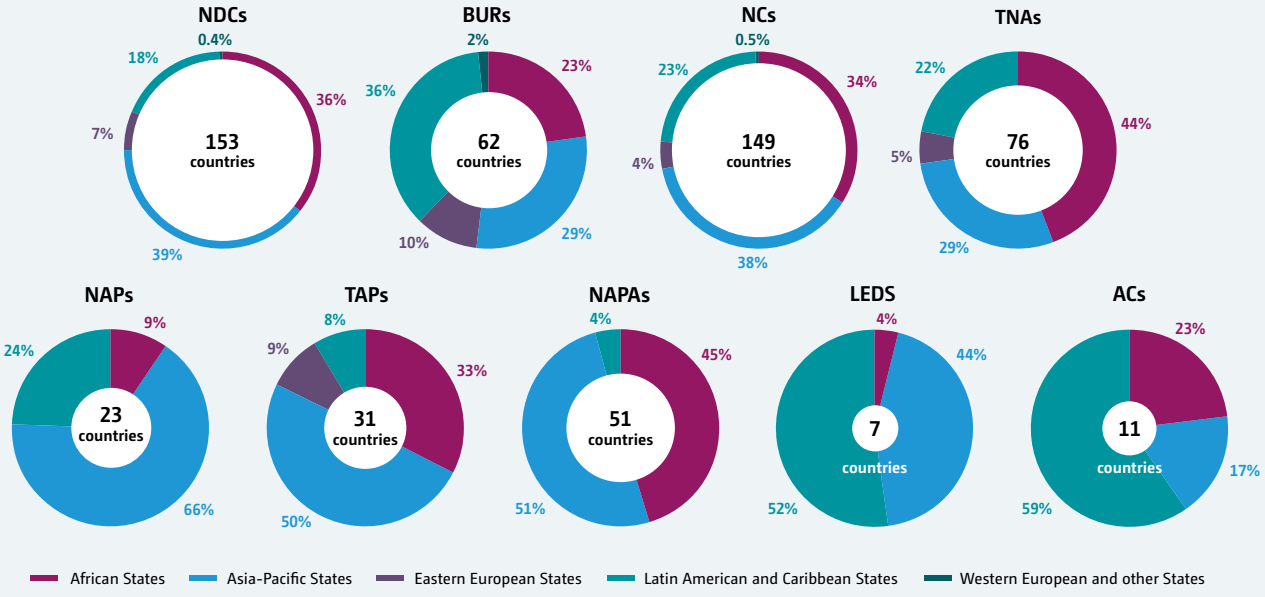
Number of needs expressed by developing countries in national reports by theme and means of implementation and sector

2.3a: By theme



	NDCs	BURs	NCs	TNAs	NAPs	TAPs	NAPAs	LEDS	ACs
Mitigation	1,956	1,588	2,579	998	-	890	-	267	-
Adaptation	1,991	224	3,841	1,156	2,270	1,390	1,126	87	185
Crosscutting	281	217	918	61	6	7	-	126	-
Unspecified	-	-	-	28	8	-	-	-	-

2.3b: By region



2.3c: By means of implemenation

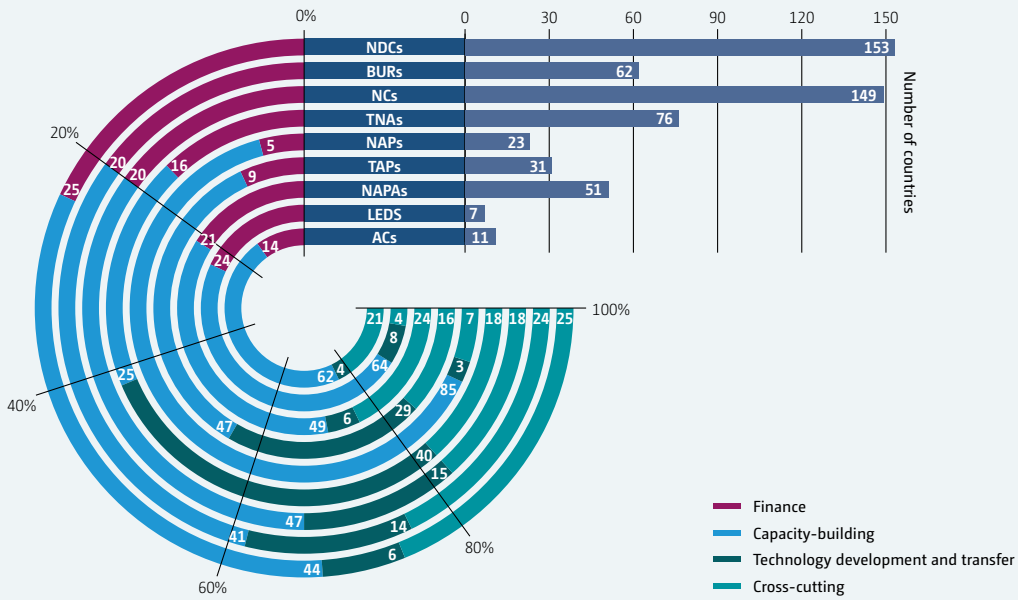
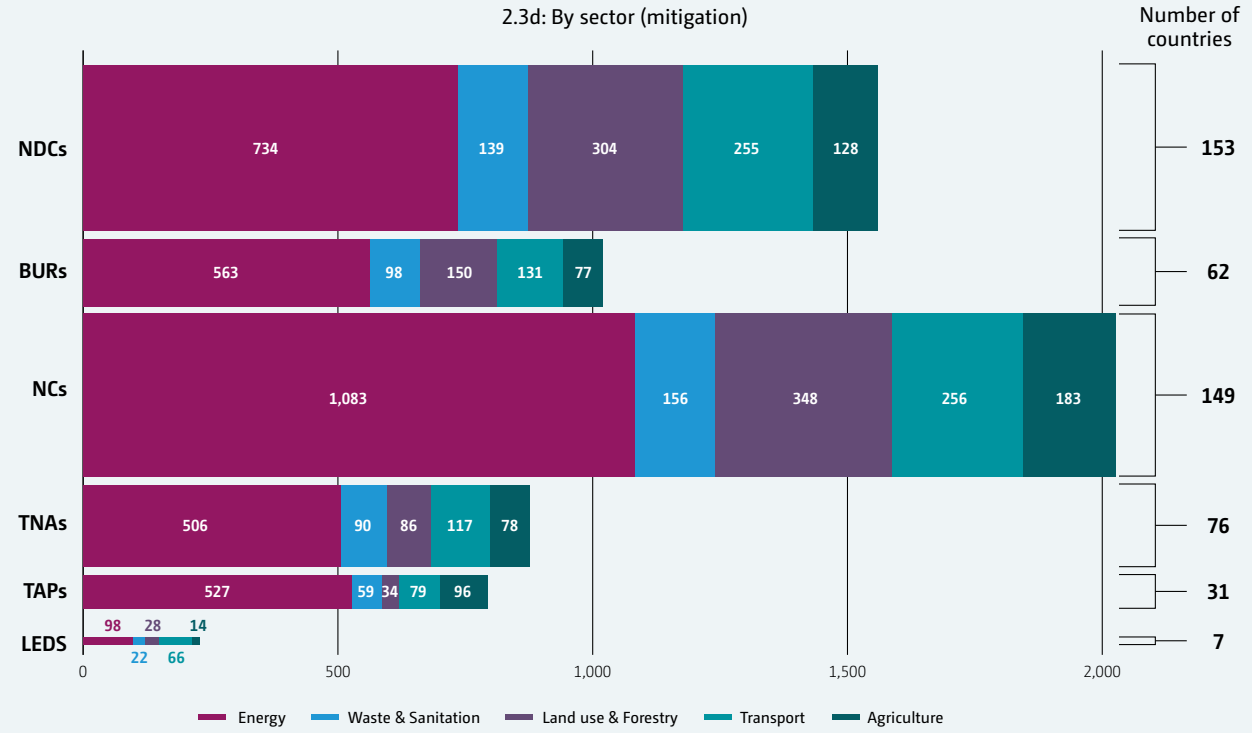
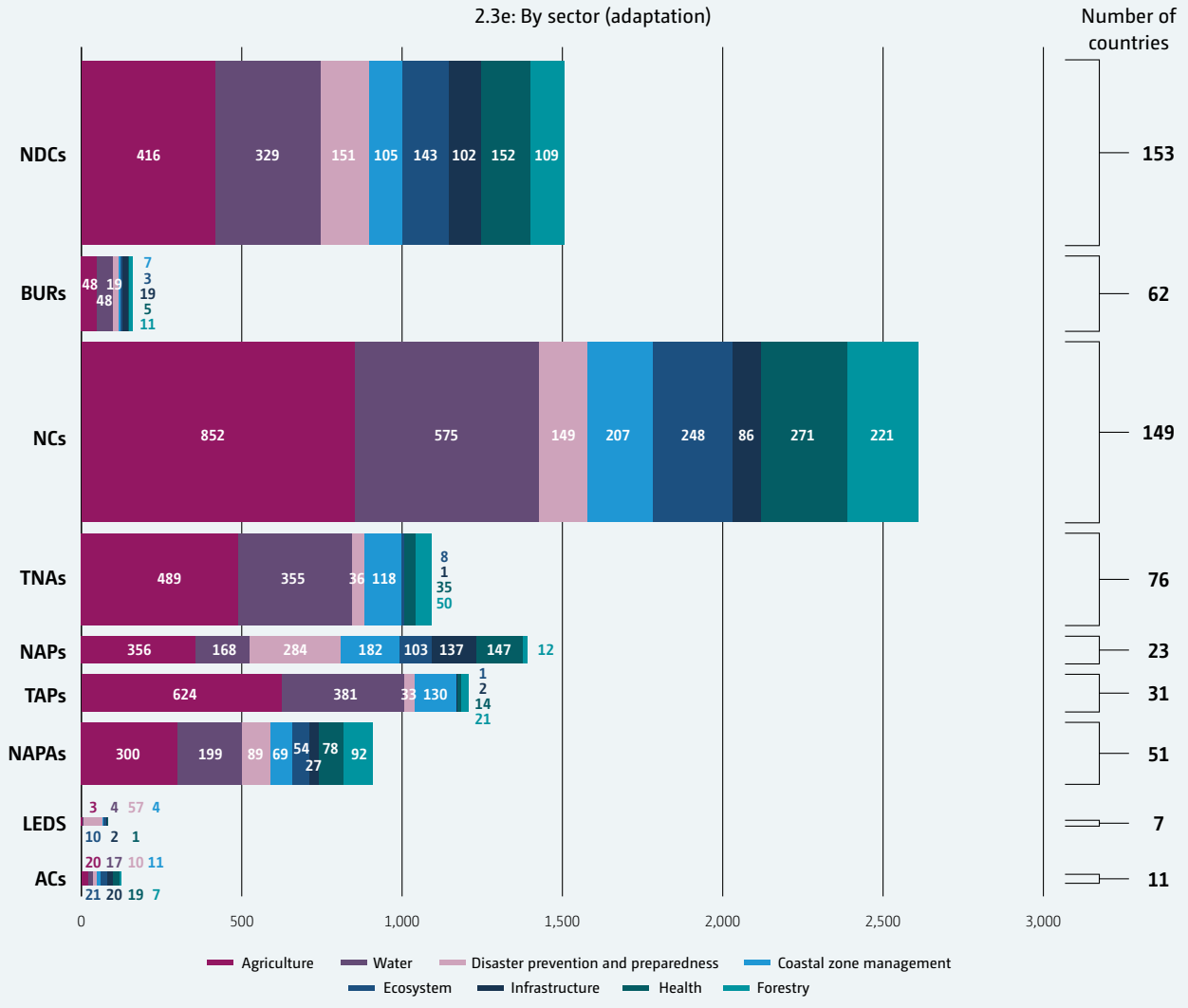


Figure 2.3

Number of needs expressed by developing countries in national reports by theme and means of implementation and sector





55. The majority of expressed mitigation needs in the **land-use and forestry sector** represented a few densely forested countries, such as Bhutan, Brazil, the Congo, Costa Rica, Ghana, Guyana, the Lao People's Democratic Republic, Malaysia, Papua New Guinea, Suriname, the United Republic of Tanzania and Viet Nam. This sector covers key activities such as reforestation, forest fire prevention, social forestry development, sustainable forest management, development of sustainable supply chains for forest commodities, spatial planning forestry research and some land-use activities, such as management of livestock. Data in NCs and NDCs showed that, within this sector, needs related to reforestation are the largest in financial terms.

56. On the basis of the number of adaptation-related needs expressed across the nine national report types, agriculture and water are the two lead sectors for climate change adaptation actions, followed by disaster prevention and preparedness, coastal zone management and health (see figure 2.3 e).

57. Adaptation needs in the **agriculture sector** cover a wide variety of land uses that overlap with other key sectors. Needs related to agroforestry and irrigation, for example, also touch upon areas or land managed under the forestry and water sectors. Needs related to the agriculture sector relate to crop diversification, development of resistant crops, land and soil management, livestock management, and fisheries and aquaculture.

58. Adaptation needs in the **water sector** are dominated by the need for water distribution infrastructure, water harvesting and irrigation. Other types of need in this sector vary widely and cover water resource management, water storage and water sanitation. In NDCs, about 38 per cent of expressed needs in the water sector include financial information. Water distribution infrastructure, including wastewater treatment, was the largest need in financial terms across all types of report.

2.2.3 Other areas of needs

59. **Gender, indigenous peoples and vulnerable groups:** In general, where these topics are included in national reports, information may relate to commitments, policies and/or strategies. Across all reports, less than 10 per cent of needed activities referred to issues related to gender and specific communities, with the exception of GCF country programmes, in which 25 per cent of needs were either gender-responsive or referred to the issues of specific communities. In NDCs, examples of mitigation activities include 1) in the energy sector, a commitment to a gender-responsive and human rights based approach in NDC-related planning, programming and implementation; and 2) in the forestry sector a requirement for 50 per cent of the members of committees for forest community-based management to be women. Regarding adaptation, some activities under the agriculture and health sectors referred to issues related to gender and specific communities; for example, implementing strategies to reduce health impacts related to diseases exacerbated by climate change especially for indigenous peoples and women.

60. Some reports that expressed needs for policy development were linked to the SDGs and the AAAA. In general, the implementation of climate actions is mainstreamed in SDG-related actions. However, a few reports expressed needs focusing on institution-building and policy development, aiming to link climate commitments with the SDGs; for example, Jordan's need to align its intended nationally determined contribution with the SDGs, and Morocco's needs (expressed in its NCs) to strengthen the National Institutional Framework of Climate Change through a regulatory system based on the Framework Law on the National Charter for Environment and Sustainable Development.

2.3 Information and data from regional and global reports, strategies and programmes

61. This section provides an overview of information and data on developing country needs derived from the following sources:

(a) Studies on the investment needs for scenarios or pathways to limit global temperature increases to 1.5 °C or well below 2 °C where a carbon constraint is introduced into economic models (e.g. IPCC, IEA etc.);
(b) Studies on modelling the costs, such as adaptation costs, of responding to climate change (e.g. UNEP);
(c) Studies on the infrastructure and services needs of developing countries in meeting the SDGs and other development goals, including in relation to climate action;

(d) Studies on investment opportunities in specific sectors or markets based on demand drivers such as policy and demographic changes;
(e) Country- and regional-level programmes and strategies developed by multilateral, regional and bilateral financial institutions.

62. Table 2.4 provides a non-exhaustive overview of available sources of information and the total or incremental investment needs in developing countries on a cumulative or an annualized basis.

63. The following section provides available information in three sections: mitigation; adaptation and climate resilience; and broader investment needs that include mitigation and adaptation objectives.

Table 2.4

Overview of sources of information on total and incremental investment needs in developing countries

Publication	Time period	Geographical region	Total (USD billion)		Annualized (USD billion)		Per cent GDP	Comment
			Total	Incremental	Total	Incremental		
Mitigation								
McCollum et al (2018)	2016–2050	Global			2,370–4,680	150–1,700		1.5°C pathway range from six global energy-economy models
IEA SDS (SDS) (2020)	2020–2030	Global			2,668	341		Pathway with 50 per cent probability of 1.65°C temperature rise. Incremental costs are against a stated policy scenario baseline that includes NDCs.
IEA SDS (2020)	2031–2040	Global			3,844	968		
IRENA (2020)	2016–2050	Global	110,000	15,000	3,200	300		Incremental costs for a well below 2°C scenario against a planned energy scenario including NDC targets and other stated policies.
IFC (2016, 2018)	2016–2030	Emerging markets	23,800–29,434					Based on IFC (2016, 2018) climate-smart investment potential in power, transport, buildings, waste and industry in 25 countries using NDC targets and sector-specific policies. High range estimate represents investment potential in cities based on urban populations in all emerging markets.
AfDB (2021)	2020–2030	African countries		715				Calculated using USD 100/t CO2 eq price for conditional NDC targets
AILAC (2020)	2020–2050	Latin American countries	107.3 by 2030 75.4 by 2050					
Adaptation/Resilience								
Hallegatte et al (2019)	2015–2030	LMICs				120–670		Incremental costs to all power, transport and water infrastructure in Rozenberg and Fay, 2019 (see above), if specific hazard risks unknown
Hallegatte et al (2019)	2015–2030	LMICs				11 –65		As above, if specific hazard risks are known

Table 2.4 (continued)

Overview of sources of information on total and incremental investment needs in developing countries

Publication	Time period	Geographical region	Total (USD billion)		Annualized (USD billion)		Per cent GDP	Comment
			Total	Incremental	Total	Incremental		
Global Commission on Adaptation (2019)	2020–2030	Global	1,800		180			In five areas to yield net benefits of USD 7.1 trillion: early warning systems, climate-resilient infrastructure, crop production, mangrove protection and resilient water resources
UNEP (2016)	In 2030	Developing countries			140–300			Costs of adaptation – indicative level of costs based on bottom-up synthesis of national and sector-based studies
UNEP (2016)	In 2050	Developing countries			280–500			
IMF (2020)	2020–2030	Emerging markets and developing economies			520.5		1.1 – 1.5 (0–10 per cent country level)	Public investment costs for resilience of physical infrastructures. Bottom-up aggregates as done in Rozenberg and Fay 2019 (see above) for retrofitting, upgrading and coastal protection
AfDB (2021)	2020–2030	African countries	259–407 (166–260*)					Calculated on the basis of a 6–10-fold increase of 2020 adaptation finance needs stated in 28 NDCs extrapolated to 53 countries. *64 per cent is estimated to be derived from international sources.
AfDB (2021)	2020–2030	African countries	289.2–440.5					Net damages including adaptation investments, adaptation costs and residual damages based on impact on GDP in 2050 extrapolated to GDP growth from 2020 to 2030.
AILAC (2020)	2020-2030	Latin American countries	19.3 by 2030.					
Broader sustainable investment needs including climate mitigation and/or adaptation								
ADB (2017)	2016–2030	Asia and the Pacific	26,166	3,615	1,744	241	5.9	Investment in new infrastructure and maintenance of existing infrastructure in power, transport, telecommunication, water and sanitation sectors including climate mitigation in the power sector and 'climate-proofing' estimates for water, transport and power infrastructure.
Rozenberg and Fay (2019)	2015–2030	Low and middle-income countries (LMICs)			640–2,744 (1,546)		2.0 – 8.2 (4.5)	Capital infrastructure costs for LMICs in power, transport, water supply, flood prevention and irrigation to achieve SDGs and decarbonization goals. Preferred scenario in brackets.

2.3.1 Mitigation

64. The IPCC Special Report on Global Warming of 1.5 ° C, estimated that average annual investments in energy supply will range from USD 1.6 to 3.8 trillion (2010 USD) globally to 2050 (IPCC, 2018). The report refers to a dedicated multi-model comparison study (McCollum et al., 2018) that provides regional breakdowns of global energy-related investment needs, as shown in Table 2.5. The additional investment compared with baseline pathways is estimated to be approximately USD 840 billion per year (range: USD 150 –1,700 billion). Low–carbon energy supply investments, such as renewables, are projected to be the largest in developing Asia.[32]

Table 2.5

Average annual energy-related investment in a 1.5 °C pathway by region for 2016–2050 (USD 2010 trillion)

Region	Total energy investment	Proportion low carbon investment	Total energy supply-side investment	Proportion low carbon investment
OECD 1990+European Union	0.70 – 1.20	0.48 – 0.94	0.55 – 1.08	0.34 – 0.83
Asia	0.84 – 2.08	0.53 – 1.63	0.59 – 1.79	0.28 – 1.34
Middle East and Africa	0.28 – 0.75	0.16 – 0.62	0.2 – 0.67	0.08 – 0.54
Latin America and the Caribbean	0.16 – 0.35	0.12 – 0.29	0.13 – 0.31	0.07 – 0.24
Reforming economies	0.09 – 0.29	0.07 – 0.23	0.07 – 0.23	0.05 – 0.16
World total	**2.37 – 4.68**	**1.60 – 3.73**	**1.59 – 3.81**	**0.82 – 2.86**

Note: Supply-side investments include investments only in supply of energy such as power generation and resource extraction, while "Total energy investment" includes both supply- and demand- side investments, such as in energy efficiency.

Source: McCollum et al. (2018).

32) Regional classifications are those commonly used in the IPCC AR5. Reforming economies refer to countries of the former Soviet Union with economies in transition. OECD 1990+European Union refers to OECD member countries in 1990 as well as EU members and candidates.

65. The energy mix of technologies varies significantly for each of the six models compared in the study (McCollum et al., 2018), as shown in figure 2.4. Non-bio renewable energy technologies such as hydro, wind, solar and geothermal power require the most investments on average across the six models – USD 491 billion a year (range: USD 121–1,116 billion). Grid investments and storage, at USD 488 billion a year (range: USD 167–809 billion), and extraction and conversion of fossil fuels, at USD 370 billion a year (range: USD 224–560 billion), are the next largest investment areas. On the demand side, energy efficiency investment needs make up the remainder of total energy investment estimates, at USD 659 billion a year on average across the models (range: USD 562–755 billion), although the McCollum et al. report does note the uncertainty around modelling these investment estimates (IPCC, 2018).

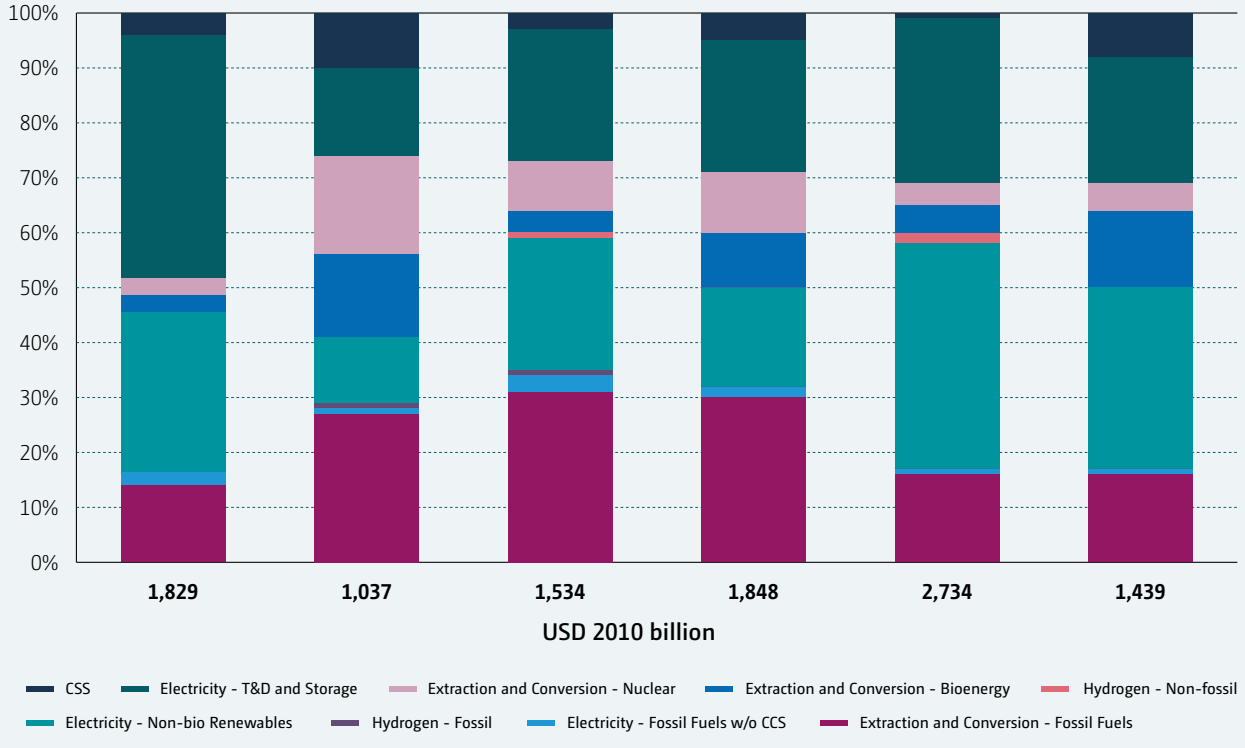
66. The **International Energy Agency (IEA) World Energy Outlook** estimates global energy investment needs under two scenarios, the Sustainable Development Scenario (SDS) and the Stated Policies Scenario (NPS). The former includes investment projections that address climate change, achieve universal access to energy and improve air quality. In comparison, the SPS incorporates existing energy policies and an assessment of the results likely to stem from the implementation of announced policy intentions such as the NDCs.

67. The scenarios are compared with current investment trends in the IEA's World Energy Outlook and World Energy Investment Report. According to the SDS, annual average investment in energy supply would need to reach 2019 USD 2.7 trillion between 2020 and 2030, compared with 2019 USD 2.3 trillion in the SPS. However, the 7.8 per cent increased aggregate cost of the SDS masks more significant changes by segment, where investment in low-carbon power is 67.3 per cent more in that scenario compared with the NPS, and fossil fuel supply is 20.1 per cent less.

68. In each region, the largest gap for investments to achieve the SDS compared with historical trends is in developing countries. A threefold to fourfold increase in

Figure 2.4

Distribution of energy supply investments by technology across six global energy–economy models in a 1.5 °C pathway



Source: McCollum et al., 2018.

Table 2.6

Energy supply investments by technology across six global energy–economy models in a 1.5 ° C pathway (USD 2010 billion)

Technology area	Model						
	AIM/CGE	IMAGE	MESSAGEix-GLOBIOM	POLES	REMIND-MAgPIE	WITCH-GLOBIOM	Average
CCS	76	109	41	90	26	109	75
Electricity – transmission, distribution and storage	808	167	374	435	809	335	488
Extraction and conversion – nuclear	53	182	137	197	117	72	127
Extraction and conversion – bioenergy	59	153	60	185	130	204	132
Hydrogen – non-fossil	0	0	10	1	68	0	13
Electricity – non bio renewables	532	121	375	327	1116	478	491
Hydrogen – fossil	0	15	16	7	1	0	6
Electricity – fossil fuels without CCS	44	13	47	45	36	16	34
Extraction and conversion – fossil fuels	256	278	474	560	431	224	370

Source: McCollum et al., 2018.

Notes: Models from left to right: AIM/CGE; IMAGE; MESSAGEix-GLOBIOM; POLES; REMIND-MAgPIE; WITCH-GLOBIOM. Data refers to estimates for Asia, the Middle East and Africa, Latin America and the Caribbean, and reforming economies.

annual RE investments is needed in Africa and South East Asia and Eurasia with the outlier of Middle East, where the increase above the historical trend is 10-fold. End-use investment combining energy efficiency and other end-uses such as electric vehicle charging infrastructure are set to increase three to four times in India, Africa and South-East Asia, with the Middle East again being an outlier with a 10-fold increase. While RE investment dominates total investments in South-East Asia, Other Asia[33] and Africa in the SDS, end-use investments make up a higher share in China, India, Europe and North America (IEA, 2019).

69. The **International Renewable Energy Agency (IRENA)** has developed an energy transformation scenario that aims to achieve a 70 per cent reduction in energy-related emissions by 2050, which is deemed compatible with the goal to keep global temperature rise to 1.5 °C (IRENA, 2019 and 2020). Cumulative investments of USD 110 trillion are needed from 2016 to 2050, approximately USD 15 trillion of which is incremental to a scenario based on policies and plans as at 2019. This equates to USD 3.2 trillion in annual terms compared with USD 2.9 trillion. A further USD 20 trillion would be needed between 2050 and 2060 to reach net zero energy-related emissions.

70. In relative terms, investment in renewable energy is most needed in sub-Saharan Africa (SSA) where it makes up 41 per cent of the region's annual investment needs, compared with 28 per cent at the global level. Energy efficiency investment features most prominently in MENA where it makes up 65 per cent of the region's annual investment needs compared to 41 per cent globally. Electrification of heat and transport captures between 15 and 18 per cent of relative investments in East Asia, North America, SSA and Western Europe. In concert

33) Does not include countries such as China and India.

with the region's demand for renewable investment as well as electrification of heat and transport, power grid investment also features in SSA at 17 per cent.

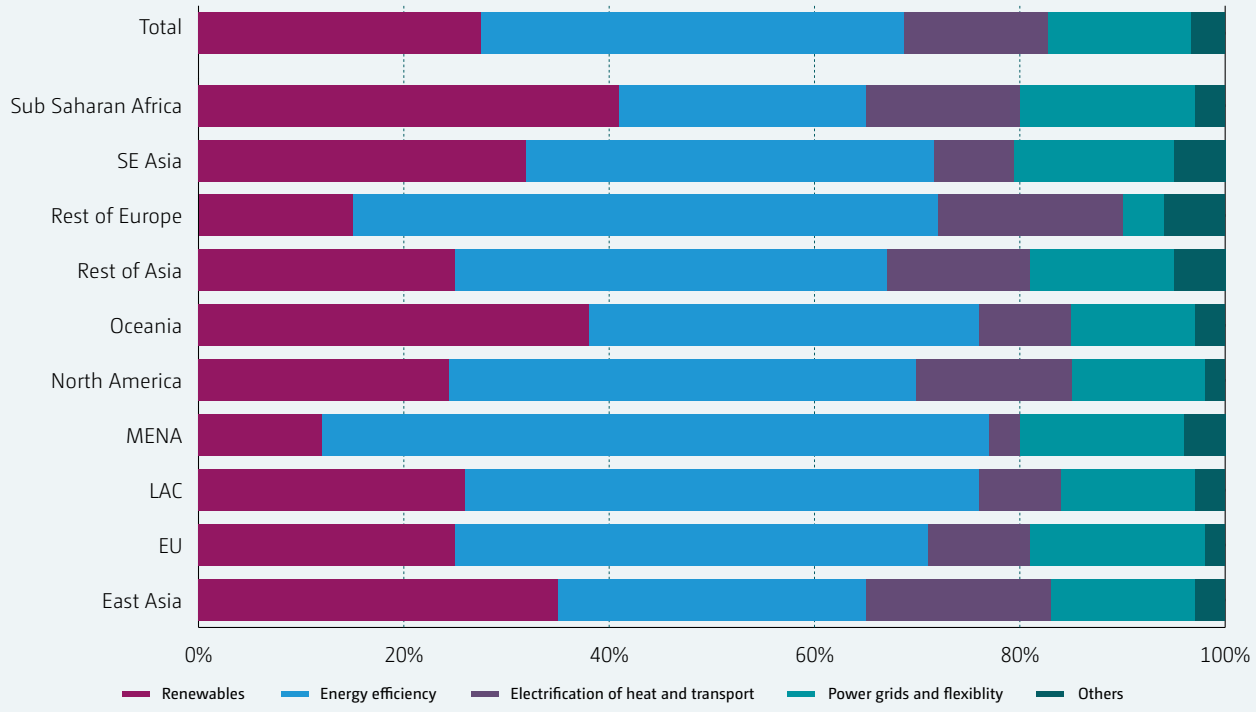
71. In 2016, the **IFC estimated climate-smart investment opportunities in emerging markets** at USD 23 trillion out to 2030 in 21 emerging markets across six regions. Rather than being based on modelling constraints to reach emission goals or incremental costs, the estimate was derived from unconditional NDC targets driving market sizes in different sectors and by applying unit costs to derive the investment potential. Sectors included renewable energy, electric transmission and distribution, industrial energy efficiency, buildings, transport and waste. Of the investment potential, 72 per cent was found in the construction and retrofit of green buildings, primarily in East Asia-Pacific, 16 per cent in transport, primarily in Latin America and the Caribbean, and 8 per cent in renewable energy, primarily in East Asia-Pacific. Key gaps in the report included lack of data for climate-smart agriculture and electric vehicles.

72. In 2017, an update report focused on South Asia increased the region's estimate from USD 2.2 to 3.4 trillion from 2018 to 2030, with electric vehicles, urban water and climate-smart agriculture included in the analysis (IFC, 2017). Of the investment opportunity, 45 per cent is in green buildings and 20 per cent in electric vehicle roll-out. In 2018, another update report focused on investment potential in all emerging market cities found USD 29.4 trillion in climate investment opportunities out to 2030. Green buildings represented 84 per cent of the total and the largest segment across all regions as urbanization rates are projected to continue out to 2030. Electric vehicles (USD 1.6 trillion), climate-smart water and public transport (each USD 1 trillion) were identified as other significant opportunities.

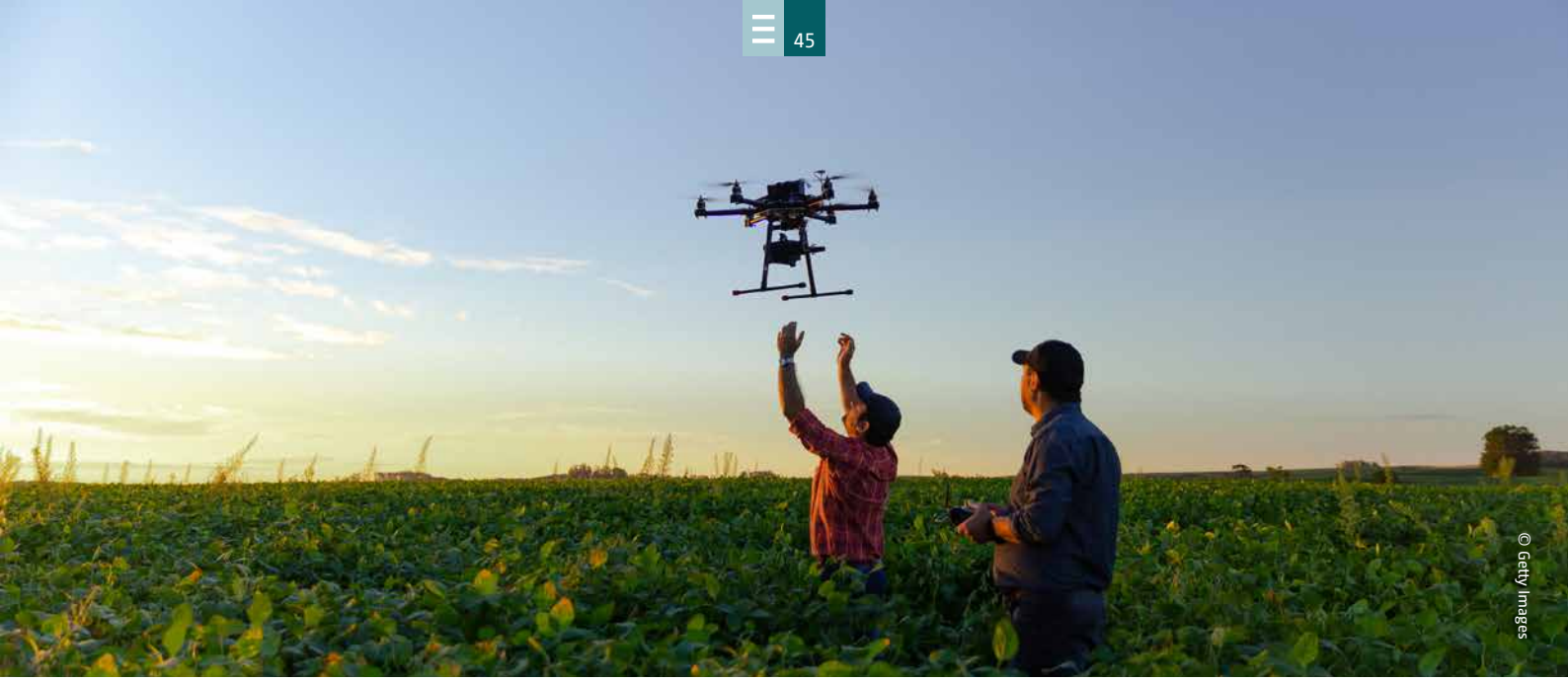
73. The **African Development Bank** calculated mitigation needs at an estimated USD 715 billion cumulative between 2020 and 2030 by applying a USD 100/tCO2eq cost to the emission reductions in the conditional NDC targets of 44 African countries. A further

Figure 2.5

Shares of annual average clean energy investments in the International Renewable Energy Agency transforming energy scenario, by region, 2016–2050



Source: IRENA, 2019.



analysis of regional integration strategy papers identified USD 7.2 billion of needs in the energy sector and USD 4.7 billion in the transport sector, although estimates may be incomplete due to lack of data strategies in two regions. AfDB's African Economic Outlook further estimates investment needs on a continental level of USD 350–470 billion in the transport sector to upgrade roads and networks, while USD 350–500 billion estimates in the energy sector are comparable to the Light Up and Power Africa estimates to achieve universal electricity access of USD 420–670 billion.

74. AILAC estimated total costs for mitigation needs at USD 107.3 billion by 2030 and USD 75.4 billion by 2050 (Serebrisky, 2014). AILAC references an IDB publication that suggests that the Latin American and Caribbean region needs to increase its investment in infrastructure by at least 2 per cent of its gross domestic product, in order to go from USD 150 to 250 billion per year.

2.3.2 Adaptation or resilience

75. For adaptation, the **2016 UNEP Adaptation Gap report** identifies that the global costs of adaptation could range from USD 140 to 300 billion per year by 2030, and USD 280 to 500 billion by 2050. Adaptation in coastal areas, water management, agriculture and the built environment were sectors highlighted in the literature on cost estimates. The wide range in estimates reflects differences in future scenarios, coverage and assumptions across national and sector-level studies. These figures also focus on the cost of planned adaptation, mainly by the public sector, and do not include consideration of household or private adaptation or account for information gaps regarding adaptation in industry, biodiversity and ecosystem services. The 2018 and 2020 updates to the Adaptation Gap Reports noted additional studies on adaptation costs that reinforced the findings of the 2016 report but were not possible to aggregate into new global assessments. Cost estimates also tend to not include the programming and implementation costs of adaptation. For example, the 2018 report noted that in road infrastructure the additional costs for adaptation can range from 0.5 to 10 per cent of total investment costs and for projects implemented by climate funds, additional costs of design and implementation typically range between 10 and 20 per cent of the total costs (UNEP, 2016).

76. The incremental costs of making infrastructure resilient was also assessed by the World Bank (Hallegatte et al., 2019) for low- and middle-income countries between 2015 and 2030. It found that the costs of making power, transport, and water and sanitation infrastructure resilient can range from 8 to 45 per cent (USD 120 to 670 billion a year) of all infrastructure investments to the amount of USD 1.5 trillion a year (based on the preferred scenario identified in the World Bank's Beyond the Gap report (see para. 82 below). However, the study also noted the costs determined if the degree of exposure of infrastructure to natural hazards, related to their location, intensity and level of risk, were known and incorporated, rather than the costs being determined by applying uniform measures across all assets. This method reduced the incremental cost to 3 per cent of total investment (USD 11 to 65 billion per year).

77. In addition, the **Africa Adaptation Gap Reports** by UNEP determined adaptation needs and costs for Africa across sectors and sub-regions according to different temperature scenarios. Adaptation costs could rise to about USD 50 billion/year by 2050 in a 2 °C scenario, and double to USD 100 billion per/year by 2050 in a more than 4 ° C scenario. In terms of sectors, the report identifies that in sub-Saharan Africa, the highest

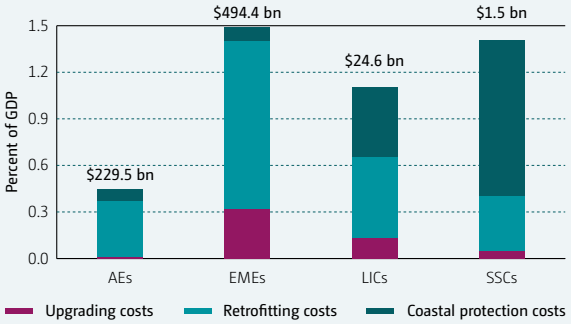
adaptation costs are projected to be needed in the water supply, coastal zone protection, infrastructure, and agriculture sectors. For the Middle East and North Africa, the focus of adaptation is in infrastructure, coastal zone protection, and adapting to extreme weather events (UNEPa, 2015).

78. The **Global Commission on Adaptation** estimated a global cost of USD 1.8 trillion from 2020 to 2030 in five areas: strengthening early warning systems, making new infrastructure resilient, improving dryland agriculture crop production, protecting mangroves, and making water resources management more resilient (GCA, 2019). The investment could generate USD 7.1 trillion in net benefits. The estimate does not represent total global investment requirements due to the focus on these five areas, but is an illustrative cost based on available data on economic returns to calculate the cost-benefit ratio.

79. The **IMF Fiscal Monitor 2020** estimates global annual public investment costs for adaptation on infrastructure resilience at USD 750 billion, of which USD 520.5 billion is required in total in countries with emerging market economies (USD 494.4 billion), low-income countries (USD 24.6 billion) and small States (USD 1.5 billion). The analysis combines the costs of (1) retrofitting existing economic assets and (2) upgrading projected investment in the sectors of energy, water, transportation and social services sector facilities, as well as (3) building coastal protection infrastructure. Global sector totals for the three costs are USD 115.3 billion for upgrading, USD 554.2 billion for retrofitting and USD 80.4 billion for coastal protection. Annual costs as a percentage of GDP are at least double in countries with emerging market economies, low-income countries and small States compared with high-income countries, that is, 1.1 to 1.49 per cent compared with 0.45 per cent. Investment needs expressed in per cent of GDP for upgrading new infrastructure and coastal protection are proportionally greater in lower-income countries and small States, while retrofitting existing infrastructure is the major cost component in countries with emerging market economies. Countries in Asia and the Pacific, Africa and the Caribbean face above-average costs because a large share of their existing and future infrastructure is exposed to climate hazards. The costs are highest in South Asia (average of 3.9 per cent of GDP), followed by East Asia and the Pacific (2.0 per cent), sub-Saharan Africa (1.3 per cent) and Latin America and the Caribbean (1.0 per cent). The report restricts estimations of public investment needs to two types of natural hazard – floods and cyclones – and does not include preparation for droughts or temperature changes, which is projected to be substantially less expensive according to the Global Commission on Adaptation (2019).

Figure 2.6

Public investment needs for resilience of physical infrastructure by country groupings, GDP weighted average



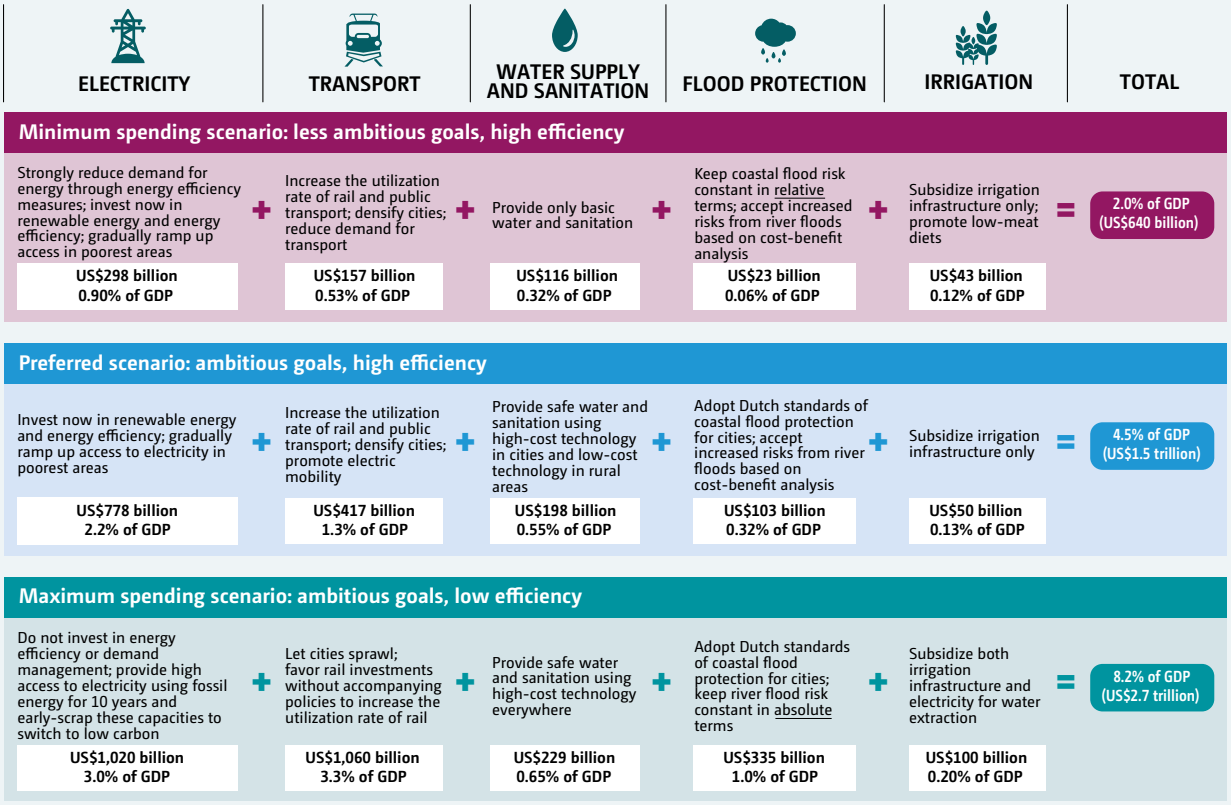
Source: International Monetary Fund. 2020. *Fiscal Monitor. Policies for the Recovery.* Washington, D.C.: International Monetary Fund.

80. Taking the magnitude increase required in adaptation finance based on the UNEP Adaptation Gap Finance Report (2016) and applying it to the adaptation needs by 2020 identified in 28 NDCs, the **African Development Bank** estimated cumulative adaptation costs for 2020–2030 at USD 259–407 billion. If the ratio of finance expected from international sources were to remain at 64 per cent as it was in 2020, it would result in USD 166–260 billion of needs from international sources. The major sectors in need are agriculture and water, followed by health, energy and biodiversity. Another AfDB study identified net damages including adaptation investments, adaptation costs and residual damages of 0.89 per cent of GDP in 2050 in a low warming (below 2 °C) scenario and 1.35 per cent of GDP in a high warming (4 °C) scenario. Taken against projected GDP growth rates for 2030, the estimated cumulative net damages between 2020 and 2030 amount to USD 289.2–440.5 billion. A further submission by AILAC estimates total costs for adaptation needs[34] at USD 19.3 billion by 2030.

34) For the countries of Costa Rica and Peru.

Figure 2.7

Average annual cost for infrastructure development investments in low- and middle-income countries for the preferred scenario and full range of results, by sector, 2015–2030



Source: Rozenberg and Fay, 2019

Notes: The infrastructure development investment costs range from 2 to 8 per cent of GDP per year.

2.3.3 Broad sustainable investment estimates, including for climate mitigation and adaptation

81. In 2017, the **Asian Development Bank** undertook an assessment of the infrastructure needs of its developing country members between 2016 and 2030, covering transport, power, telecommunications and water supply and sanitation. The assessment included how much the region would need to invest in infrastructure to continue economic growth, eradicate poverty and respond to climate change and found that USD 1.7 trillion per year is needed for infrastructure investment, which is USD 200 billion more than a baseline estimate without the costs of mitigation and adaptation.

82. The **World Bank**, in its **Beyond the Gap** report (Rozenberg and Fay, 2019), estimated an investment need of between USD 640 billion and 2.7 trillion per year (or between 2 and 8 per cent of GDP) between 2015 and 2030 for low- and middle-income countries to achieve infrastructure-related SDGs across the electricity, transport, water and sanitation, flood prevention and irrigation sectors and to stay on track to limit the temperature rise to 2 °C. As decarbonization goals are included across all estimates, the range depends on the ambition in achieving the SDGs and the effectiveness of policy choices to achieve them, rather than on a difference between the 'business as usual' and climate-compatible scenarios. A preferred scenario based on these policy choices estimates investments at USD 1.5 trillion per year (figure 2.7).

2.4 Relationship of information on needs expressed in national reports and in global and regional reports

83. As noted above, the articulation of needs in national reports submitted as part of the UNFCCC process (see chapter 2.2), covers multiple facets of implementing the Convention and the Paris Agreement:

(a) The needs identified by developing countries may reflect requirements to implement national policy goals or targets to address climate change at the national and subnational level. At the international level, these may reflect the support needed to fulfil the national obligations as a Party to the Convention and the Paris Agreement;
(b) The needs may reflect the total requirements to implement national targets irrespective of whether the needs are met from domestic and/or international sources. Conversely, needs may reflect only the requirement to follow through on conditional targets;
(c) The needs may be characterized as financial support required, capacity-building activities, or technology development and transfer activities;
(d) Although many needs may be quantified in monetary terms, not all of them may be or can be, as is the case with support provided for means of implementation. Quantified needs articulated in national reports may also not reflect the totality of the needs required to meet unconditional and/or conditional targets set out in the NDCs.

84. Information on needs derived from global or regional reports in section II.C identify quantitative or monetary needs through a range of approaches that either include, extrapolate from or ignore the information in national reports depending on the objective and methodology applied. These are listed below from those approaches with less overlapping information from national reports to those closer to using the information as inputs.

85. Scenarios developed using climate-economy models to understand the investment needs of meeting global temperature goals (McCollum et al., 2018, IEA, IRENA, World Bank) do not include information from national reports as inputs in the modelling because the technology deployment required to reach temperature goals goes beyond stated targets and policies. In this way, the information in national reports does not overlap with these scenarios methodologically in terms of specific inputs to modelling. However, the information may overlap in terms of the underlying effort required to reach temperature goals (e.g. the effort needed to reach NDC targets in practice would be similar to the initial efforts needed to meet 1.5 °C pathways). Similarly, for adaptation and resilience costs (UNEP, AfDB), no information from national reports serves as an input to scenarios that assess the impacts of the less than 2 °C and greater than 4 °C pathways, although adaptation measures articulated in national reports will represent initial efforts to meet these costs.

86. Incremental cost estimates support the analysis to estimate the differences in the above-mentioned overlap. When comparing scenarios that meet temperature goals against BAU scenarios to estimate incremental costs, some reports include information from the latest national reports such as NDCs as inputs to estimate BAU scenarios (e.g. the IEA and IRENA analyses). Other reports do not do so as their BAU scenarios are set from earlier years, for example 2015 (as in McCollum et al., 2018). In estimating the costs for climate-resilient infrastructure, component cost assumptions are used to estimate the incremental costs for upgrading to new infrastructure needed to meet development needs and for retrofitting existing infrastructure (World Bank, Hallegatte et al.). This approach does not overlap methodologically with national reports.

87. Some reports (e.g. AfDB, 2021) focus on estimating needs determined by extrapolating information on stated targets and policies in national reports, for example conditional targets set out in NDCs or current needs estimates in 2020. The needs in these reports therefore overlap with needs in national reports in terms of starting point but are derived using different methods of estimation.

88. Finally, some reports focus on estimating market sizes and investment opportunities (IFC) and therefore have similar approaches to the BAU scenarios as in the IEA and IRENA analyses. They reflect the latest NDC targets and stated policies from country markets by sector.

89. None of the approaches listed above that use information from national reports utilize the articulated needs in monetary terms (see section 2.3 above). Only national emission reduction targets from NDCs, if anything, are inputs to the methodologies used in the analyses of these reports. Further, differences in scope are limited to mitigation and adaptation/resilience needs quantified in terms of investment requirements; they do not include capacity-building, technology development and transfer, and finance for implementation or participation (reporting).

Chapter III

Processes and approaches for determination of needs in developing country Parties

3.1 Key findings

90. Developing countries have varied institutional arrangements for identifying Developing country Parties have varied institutional arrangements for identifying climate change needs, which are described in most of their national reports submitted to the UNFCCC. Most countries have established specialized institutions within their ministries and departments whose mandate is to spearhead climate change actions. These institutions have various names such as climate change directorate, climate change unit, interministerial climate change coordination committee, climate change technical working group and climate research centre.

91. The needs identification process is usually not a stand-alone exercise for countries, but is part and parcel of climate change planning processes by governments that aim at establishing actions and priorities to address climate change challenges.

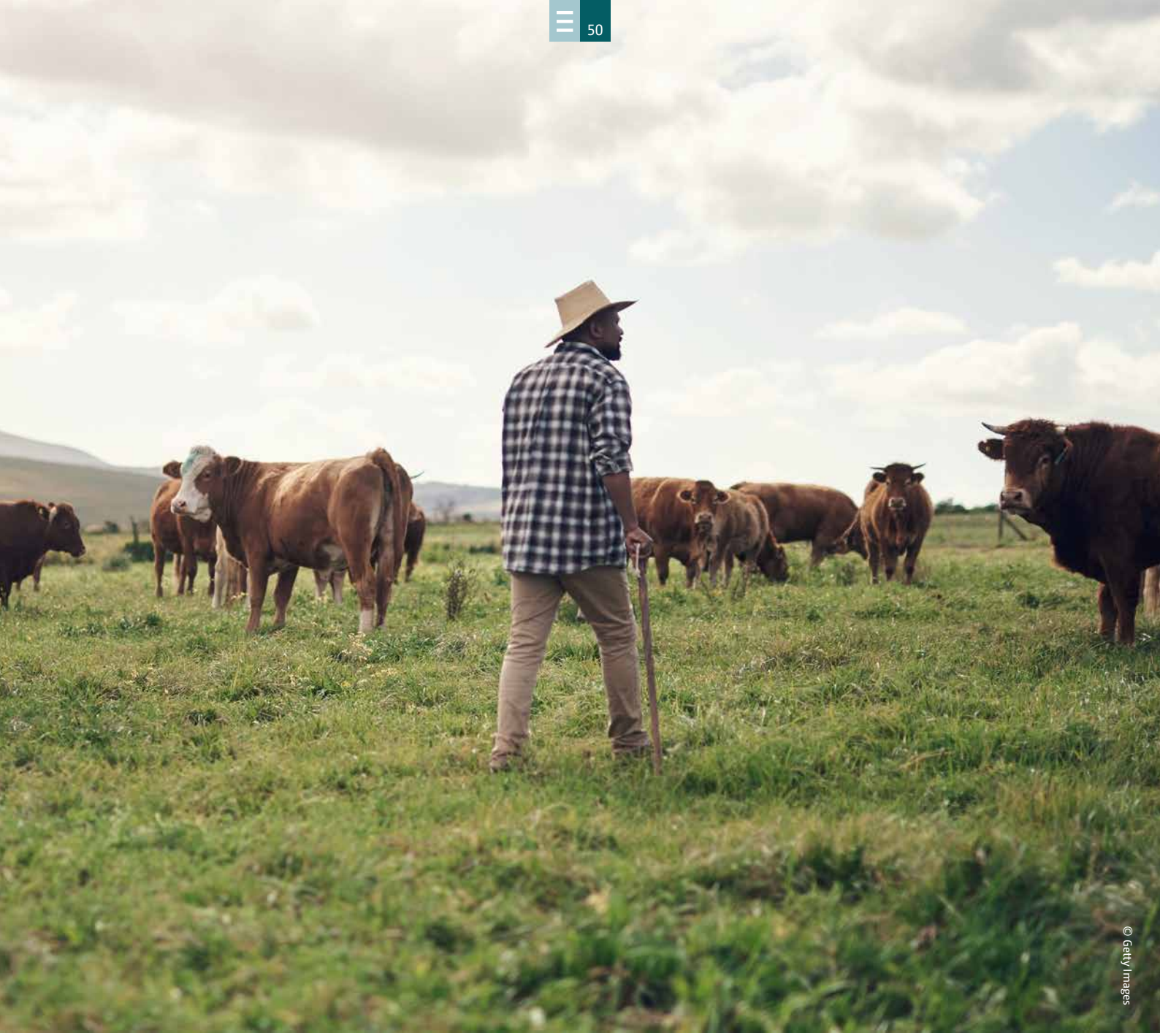
92. Good practice in ensuring buy-in and effective coordination of the needs identification process is the engagement of high-level decision-making government offices at the initial stage of the climate change needs identification process. In addition, the engagement of other stakeholders and the assignment of specific roles and responsibilities to participants representing various sectors and interest groups at both the national and subnational level was noted in the reports of the majority of developing countries.

93. Institutional arrangements for needs determination vary widely across countries. However, in most countries the ministry responsible for environmental affairs coordinates the process through a focal point or a committee. Among these, the interministerial committee is the most inclusive and likely to provide more detailed information on needs across sectors.

94. The needs identification process of most countries starts with consultations between the lead ministry and the country's leadership. This ensures country ownership and top-level support in the needs identification process

95. Stakeholder consultations are an integral part of the needs identification process. During the initial phase, background information is collected and assessments are carried out to help scope the needs. The stakeholders consulted are mainly from government line ministries, though in some instances they include non-governmental organizations and the private sector. Local communities are the least consulted stakeholders during the process.

96. In most of the country reports, the description of the needs identification process does not explicitly mention inclusivity aspects. Needs related to gender and local communities are captured in some reports



emanating from those processes. However, where the need identification process has projects and programmes as part of its outputs, gender and other inclusivity aspects of various stakeholders were mostly elaborated in the project or programme documents.

97. MDBs and United Nations agencies play a critical role in supporting developing countries in their needs identification process. In most cases, these agencies use experts during country-driven needs identification consultation forums to provide insights and share data that may help developing countries better identify and report their needs.

98. In other instances, MDBs and United Nations agencies provide financial and technical support to developing countries in the needs identification process. This support is used to carry out in-depth sectoral analysis to identify pathways within these sectors where considerable effort is needed and where greater impacts can be achieved. For countries that have benefited from this support in the second-generation NDCs, their reports provide more granular information on needs, including by sector compared to the first-generation NDCs.

99. The multilateral climate funds established under the Convention, namely the GEF, including the special climate funds managed by the GEF, the SCCF and the LDCF, the GCF and the AF, also play a critical role in providing financial support to countries for facilitating their climate change needs identification process. This is particularly evident in the GCF and AF readiness support and the GEF CBIT, which enables countries to identify and prioritize their climate change needs.

3.2 Introduction

100. This chapter broadly describes the processes and approaches employed by developing countries in identifying their climate change needs. As these processes and approaches differ widely between countries, the section will present some of the most common processes and approaches including institutional arrangements and stakeholder consultation processes. The needs identification processes as discussed here describe how countries initiate and follow through to documentation, including how countries ensure country ownership. These processes and approaches are presented as communicated to the UNFCCC through the sources listed in chapter I. Examples from a few countries are also used as case studies to further illustrate the processes and approaches employed in the needs identification process. This section mainly discusses processes and approaches from the broader perspective of institutional arrangements.

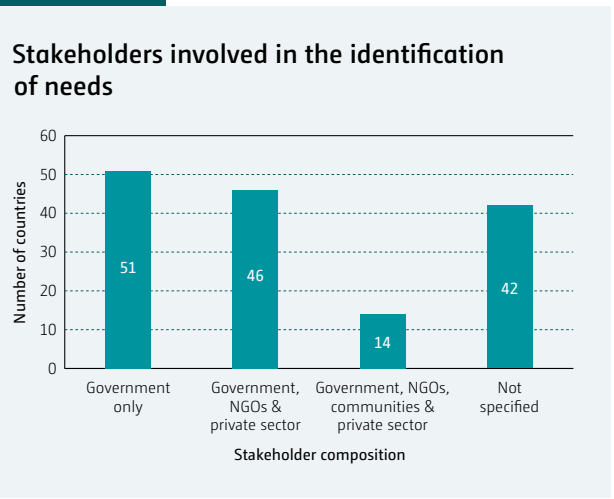
101. The needs identification process is usually not a standalone exercise but is part and parcel of climate change planning by governments, that aims at establishing actions and priorities to address climate change challenges. The process is also part of the efforts that countries make in meeting their obligations under the Convention. Therefore, the processes and approaches reported here are mainly drawn from national reports to the secretariat.

102. The needs identification process, which represents the chain of activities carried out by countries in identifying their climate change needs, varies widely among countries, and generally starts with ensuring country buy-in: top government officials are briefed on the process by the lead ministry, which is usually the ministry in charge of environmental affairs.

103. In most countries, after engaging with the country's leadership, the lead ministry appoints a focal person/committee to spearhead the needs identification process. The focal point defines the process, including how data will be collected, processed and reported. Generally, this process uses, on the basis of sources of information, one of two broader approaches: top-down or bottom-up.

104. Under the top-down approach, documented government development priorities are key to the needs identification process. In most countries, these development priorities are captured in various government development plans, policies and sectoral strategies, and a committee/unit takes the lead in identifying needs based on these documents. Due to the nature of these documents, the needs derived from this approach are mainly for the short term or medium term. The needs identified through this approach have more quantitative details than those identified from the bottom-up approach.

Figure 3.1



Source: Communications submitted as part of the UNFCCC process.

105. Under the bottom-up approach, consultation with stakeholders representing various sectors is central to the needs identification process. Consultation usually takes place during the needs identification process and serves to collect preliminary information on the needs and their prioritization. While stakeholder consultation is central to needs identification under the bottom-up approach, it is also widely used under the top-down approach.

106. Under both approaches, stakeholder consultation is a key part of the needs identification process; however, the stakeholders consulted differ significantly between countries. Most countries focus on stakeholders from government line ministries, departments, and agencies. Other stakeholders that are often consulted include non-governmental organizations, the private sector and local communities (see figure 3.1). The stakeholders consulted are mainly driven by the type of institutional arrangements that a country has adopted for its needs identification process.

3.3 National institutional arrangements

107. There is no single definition for institutional arrangements and the term is used in many different forms and contexts. In this report, institutional

© Getty Images

Figure 3.2

Institutional arrangements for needs identification

Source: Communications submitted as part of the UNFCCC process.

arrangements refer to the structures, approaches, practices or rules put in place by stakeholders at different levels to steer the process of assessing needs and impacts, identifying low-emission development pathways, determining vulnerability and risk, planning for adaptation, implementing adaptation and mitigation measures, monitoring climate finance flows, and monitoring and evaluating climate actions.

108. Institutional arrangements differ widely across countries. However, one common arrangement is the establishment of a steering committee or a climate change unit within the lead ministry, mostly the ministry in charge of environmental affairs, to lead and coordinate all efforts on the needs identification process. In most countries, members appointed to this committee are drawn from existing staff within the host ministry. This committee or unit, which is often led by a focal point, then takes up the role of identifying the needs and decides on the processes and approaches to be used in achieving this goal. Figure 3.3 below shows the common institutional arrangements adopted by developing countries in the needs identification process.

109. The focal point, who is sometimes referred to as the national focal point, serves as the key coordinator for the needs identification process. In most cases the focal point is also the official UNFCCC focal point for the country and as such is the international point of contact on climate change reporting. This role is usually assigned to a senior government official in the ministry responsible for climate change, mostly the ministry of environment. The focal point coordinates all the activities for the needs identification process and ensures quality control of all the outputs. The focal point is usually supported by specialized staff within the same ministry, who together form the ministerial committee.

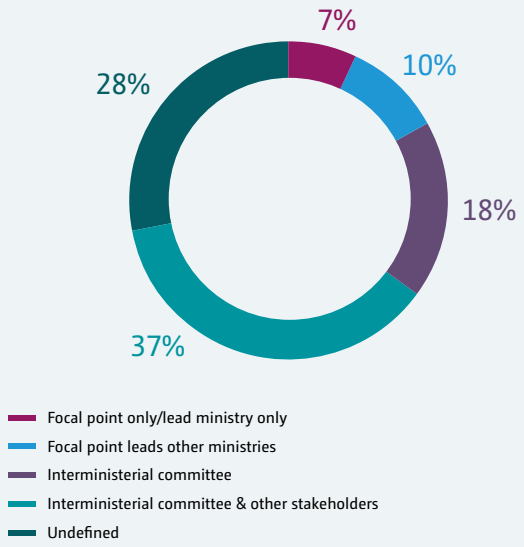
110. The ministerial committee's role is very close to that of the focal point, as its main duty is to support the coordination of the needs identification process and it is headed by the focal point. Sometimes this committee is legally established to coordinate climate change actions within the country. For countries that have formally established this committee as a government entity, the entity is referred to by various names (see paragraph 90 above).

111. To support data collection and needs identification from other sectors and line ministries, some countries form a national-level interministerial committee. This committee draws its members from sectors identified by the country as critical in the needs identification process. The line ministries select technical representatives to represent the sector on the committee, and these individuals become the sectoral focal points within the committee. The committee actively collects data from the various sectors and consolidates and analyses the data to determine the country's climate change needs. Each of the sectoral focal points spearheads data collection and analysis from their specific sector. In most cases, the sectoral focal points work closely with colleagues in the line ministry to support data collection and analysis. This arrangement is very common in countries adopting the top-down approach to needs identification.

112. Some countries adopt broad stakeholder consultations and the interministerial committee brings together actors from the private sector and from non-governmental organizations. Representatives are usually drawn from the umbrella bodies of these organizations such as associations of manufacturers, private sector federations and NGO working groups. These representatives put forward interests and provide specific data on the needs of the groups they represent. Due to the potentially large number of members of this committee, most of the stakeholder consultation forums are held in workshops, which can be quite large with up to five hundred participants. However, sometimes these workshops are organized according to sectors or interest groups represented. Interministerial committees are common in countries that adopt the bottom-up approach to needs identification.

Figure 3.3

Institutional arrangements of developing countries for climate change needs identification



Source: Communications submitted as part of the UNFCCC process.

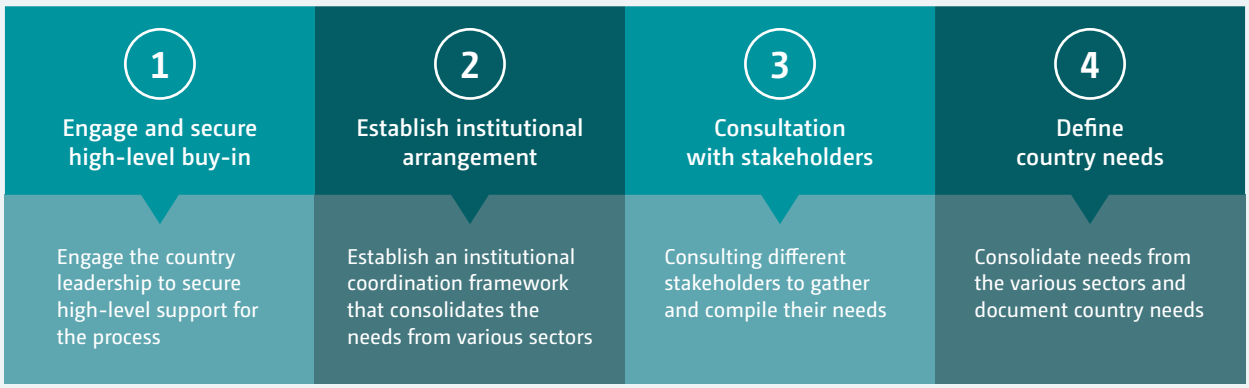
113. The most inclusive institutional arrangement for the determination of needs has the interministerial committee consult widely with the private sector, NGOs and local communities. This arrangement has been adopted by only a small number of countries, which means that local communities are the least consulted of all stakeholders in the needs identification process. Figure 3.3 shows some of the common institutional arrangements adopted by developing countries in their needs identification.

3.4 Needs identification process

114. One of the initial steps for the country's committee/unit for identifying climate change needs is to ensure there is wide buy-in for the needs identification process within the country. In most cases this buy-in is focused on the country's top leadership (the president or prime minister and/or the cabinet) This is achieved by engaging the leadership in the process (see figure 3.4).

Figure 3.4

Common steps adopted by countries' committees or units for identifying climate change needs



115. Once buy-in has been secured, the committee/unit adopts an approach, namely top-down or bottom-up, for the needs identification process that is appropriate for the country. In cases where the top-down approach is adopted, the committee engages with line ministries to collect and synthesize the information from the government development plans, blueprints and sectoral strategies. Under this arrangement, the ministerial committee and focal point are the most critical entities; however, in a few countries this arrangement also relies on the involvement of line ministries.

116. When the committee identifies the need to invite line ministries, it makes a formal request to these ministries to appoint members to the committee. The committee may develop guidance on stakeholder engagement, the terms of reference for the members and the timetable for activities. Sectors that are commonly represented in these committees are: energy, water resources, coastal resources, human settlements and urban planning, agriculture and forestry, and finance.

117. When the committee adopts the bottom-up approach, it takes the lead in organizing stakeholder consultation forums where views and priorities from various stakeholders are collected. These views and priorities are later consolidated and documented as part of the country's needs.

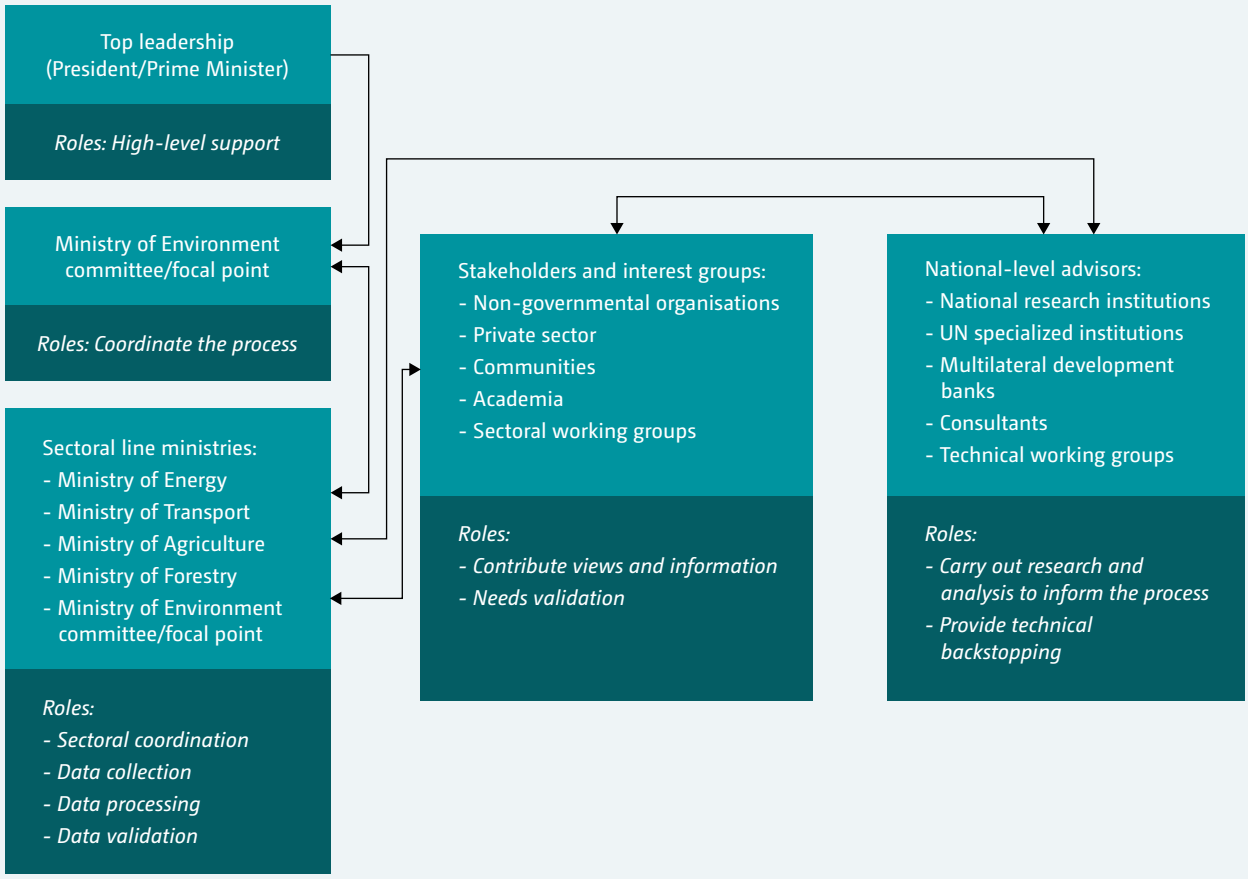
118. Once the institutional arrangement is selected the committee initiates the data and information collection exercise, which is mostly dictated by the approach and institutional arrangement selected. One of the activities conducted during this stage is stakeholder consultation; the committee selects the stakeholders to be engaged and also the form of engagement. In addition, the committee might request written submissions from line ministries or specialized institutions.

119. In several countries the committee has requested technical assistance from various research and UN organizations. These support organizations and act as a source of scientific information to inform the country's climate change needs. Some of this information is derived from country-specific assessments and some from regional climate change models. These organizations assist the countries in prioritizing climate action and in estimating the potential cost and impacts of the interventions the country envisages as part of its climate change needs. Figure 3.5 shows the interrelationships among various institutions in the needs identification process.

120. Boxes 3.1, 3.2 and 3.3 provide examples of the institutional arrangements adopted by three countries for collecting data and information for the BUR, NDC and NAP, respectively. These case studies showcase institutional arrangements that facilitated a wide consultation and determined the climate change needs of diverse stakeholders.

Figure 3.5

Interrelationships among institutions in the needs identification process



Source: Communications submitted as part of the UNFCCC process.

Box 3.1

Case study: Institutional arrangements of Chile for determining needs for the biennial update report

Chile used a three-step process to determine needs for its second biennial update report. This process ensured that the needs of various stakeholders were captured and validated at the national level. The steps were:

(a) Sending a formal survey to the public institutions comprising the Interministerial Technical Committee on Climate Change to request information on needs, gaps and barriers, by sector;

(b) Holding a workshop for the Interministerial Technical Committee on Climate Change member institutions to discuss the needs identified in the survey in order to define, inter alia, barriers, lessons learned, potential synergies, information gaps and opportunities in progressing on climate change action;

(c) Holding bilateral meetings to validate the compiled information and analyse additional needs, gaps and barriers.

Private sector needs were identified through engagement forums with their representatives, for example, trade associations, companies and economic development organizations. This engagement was a major achievement as it was the first-time private sector needs were reported. This presents a lesson for other developing country Parties on an approach that can be used in gathering information from entities outside of the public sector.

Box 3.2

Case study: Algeria's approach to nationally determined contribution formulation

In developing its first NDCs, Algeria used an inter-sectoral approach that:

(a) Formed an inter-ministerial committee that comprised of 14 ministries and was in charge of the NDC development process. This committee reported directly to the minister in charge of environment and its recommendations were discussed at an Inter-ministerial Council on Climate Change meeting that was chaired by the Prime Minister;

(b) Brought together players from the major sectors of the economy to discuss, identify and prioritize their climate change needs;

(c) Priorities identified through this process were validated and endorsed at the highest level of government, giving them broad national acceptance and ownership.

To ensure better coordination in NDC development and implementation, Algeria also established a National Climate Committee under the authority of the Minister of Environment. This Committee is composed of representatives from relevant governmental departments and the National Economic and Social Council. The main role of the National Climate Committee is to ensure coordination of and monitor and assess national policies and programmes on climate change, as well as to propose measures that will ensure the implementation of Algeria's commitments under the Convention.

This approach ensured the needs of the various actors in the country were captured and had a strong country ownership. This approach also went beyond identifying the needs as it also established a committee to coordinate, monitor and assess progress towards meeting these needs and report such progress to the national government.

Source: Government of Algeria (2016).

Box 3.3

Case study: Needs identification process to formulate and implement the national adaptation plan of Burkina Faso

Burkina Faso's NAP process reflects some of the approaches generally used in determining countries' adaptation needs. Key success factors in the needs identification process for the development of the NAP of Burkina Faso are as follows:

(a) The process was led by the Ministry of Environment and Sustainable Development and had strong political support of the Government's Secretary General;

(b) A team of 10 experts was established to spearhead the technical aspects of NAP development, comprising 9 experts with varied specialties and 1 senior expert charged with the responsibility of editing the NAP;

(c) The establishment of an inter-ministerial technical monitoring committee chaired by the Permanent Secretary for Environment and Sustainable Development and the National Council for the Environment and Sustainable Development played a significant role in coordinating the various sectors and ensuring all aspects of the sectors were integrated;

(d) Consultations with a wide range of stakeholders, including indigenous communities, were undertaken through workshops to identify the climate change impacts they faced and assess the vulnerability of each sector.

In Burkina Faso, the NAP development process was science-based, with the identification of needs not only presented by stakeholders but also informed by research conducted by a team of experts derived from different fields. In addition, the process had strong participation of various stakeholders including indigenous communities. This was made possible owing to the strong partnerships formed between local and international partners who provided the technical and financial support required.This approach ensured the needs of the various actors in the country were captured and had a strong country ownership. This approach also went beyond identifying the needs as it also established a committee to coordinate, monitor and assess progress towards meeting these needs and report such progress to the national government.

Source: Government of Burkina Faso (2015).

3.5 Processes and approaches used by other actors, namely multilateral climate funds, multilateral development banks and United Nations agencies

121. The approach employed by MDBs and United Nations agencies to determine the needs of developing countries can be described as a peer-reviewed top-down approach wherein needs determined through various methodologies are reviewed by subject matter experts before being consolidated as a country's needs. In most instances these needs are regional and cover a large area; in some cases they can be country-specific.

122. The process starts with the assembly of lead experts from the sectors of interest. This team of experts derives the needs by employing tested methodologies and techniques including; assessments, life-cycle analysis, and model simulations, as discussed in chapter 4 below.

123. For quality control, the needs determined by the team of experts are shared with a team of independent reviewers, who are also qualified experts in the field of interest. These reviewers give their feedback on the identified needs, and also comment on the process and tools used for deriving the needs.

124. Once the teams of experts and reviewers have agreed on the needs, they are consolidated and reported as the country's country-specific or regional needs.

Box 3.4

Case study: Climate finance needs determination as part of the activities of the GEF

The GEF supports climate action in developing countries through multiple funds under UNFCCC, including the GEF Trust Fund for climate change mitigation, the LDCF and the SCCF for climate change adaptation, and the CBIT Trust Fund. Country ownership is a key priority and a guiding principle of the GEF.

The determination of needs, and use of information on needs, is supported by the GEF through various means, including:

(a) Support for Convention-related plans and reports that help articulate country needs: These reports can address needs on finance, technology transfer, and capacity-building, and include NCs, BURs, Biennial Transparency Reports , NDCs, NAPs, NAPAs, and TNAs.

(b) Planning and stakeholder consultations to understand needs: The GEF supports National Dialogues and Expanded Constituency Workshops to engage in stakeholder consultations, undertake the planning process to identify priorities for support, and facilitate integration of concepts into national strategy and policy formulation through the GEF Country Support Program and upstream country programming consultations. As a consequence of the COVID-19 pandemic, the GEF Country Support Program introduced the virtual Stakeholder Empowerment Series as an interim replacement of Expanded Constituency Workshops.

(c) Addressing needs: Each proposal submitted for GEF support is required to include information on its consistency with national priorities and on how it addresses identified needs and gaps, as articulated in country plans and reports, with co-financing and partnership to help leverage additional resources and greater action.

In addition, the GEF and the GCF will support joint national investment planning in a number of countries, as part of the recently launched Long-Term Vision on Complementarity, Coherence, and Collaboration between the two funds. Such planning can utilize opportunities across the GEF and the GCF in the context of the climate finance landscape to translate NDCs into investments. Alignments with, and contributions to, post-COVID-19 stimulus and climate-resilient recovery efforts will be encouraged.

Further, predictability of support may be an important issue for countries and may influence considerations of needs/priorities to be addressed. For climate change mitigation, each country is allocated GEF resources over each four-year replenishment period through the STAR. STAR aims to allocate resources in a transparent and consistent manner based on global environmental priorities and country capacity, policies and practices relevant to successful implementation of GEF projects and programmes. The LDCF, which supports climate change adaptation in LDCs, applies the principle of equitable access. For the current GEF-7 period (July 2018 to June 2022), each LDC can access the initial cap of USD10 million per country, subject to increase, with a cumulative resource allocation ceiling of USD 50 million.

Box 3.5

Case study: Climate finance needs determination as part of the GCF country programming process

GCF country programmes are critical for each country's pipeline development with the GCF. It is also one of the three GCF project origination tools alongside Entity Work Programmes and Structured Dialogues. The country programming process should be seen as a means of ensuring stronger country ownership and stakeholder buy-in, as well as a tool for project prioritization so that countries can seek to optimize their engagement with the GCF.

The objectives of a country programme are to:

(a) Support a country-driven pipeline development process, which seeks to identify transformative project ideas to be funded by the GCF;

(b) Identify institutional needs to build and strengthen capacity;

(c) Facilitate dialogue between all stakeholders in a way that reflects the highest level of country ownership.

Among other elements of a country programme, the country needs to summarize its climate finance landscape to address its low-emission, climate-resilient development needs and priorities. This should also reflect the country's climate financing priorities over a ten-year period up to 2030 associated with the NDC cycles, as well as with its ACs, NAPs, TNAs, TPs and long-term national strategies, in addition to more immediate resilient recovery strategies.

Such information may include the following:

(a) Profile of climate finance needs for adaptation and mitigation across key priority sectors and the availability of climate finance from different public, private and other sources, domestic and international;

(b) Capacity of the financial system of the country where private sector financing is being mobilized from local financial markets or through foreign investments to address climate change;

(c) Where concessional and risk-taking climate finance from the GCF as well as other climate, environment or similar funds will be used in a complementary manner to address barriers, catalyse innovations and mobilize public and private investments towards low-emission, climate-resilient development.

Based on the country's context and wider climate finance strategy, the Country Programme will identify and provide a summary of up to five country-specific priority projects and programmes, including with the private sector where possible, to be submitted to the GCF for funding during the four years of the GCF's programming cycle.

While such prioritization does not represent a cap on the number of projects that may be funded in a country during a given programming cycle, it will allow the GCF to optimize its capacity and the available resources during any given programming cycle, including the deployment of readiness and project preparation resources to support concept note and funding proposal development.

Please refer to the GCF country programme guidance document for more information: https://www.greenclimate.fund/sites/default/files/document/gcf-country-programme-guidance.pdf.

And for a broader perspective on the GCF programming process, please refer to the GCF Programming Manual: https://www.greenclimate.fund/sites/default/files/document/gcf-programming-manual.pdf.

Chapter IV

Methodologies and underlying assumptions used in determining the needs of developing country Parties

4.1 Key findings

125. Developing country Parties identify adaptation and mitigation needs in preparing their national reports, following UNFCCC reporting guidelines and guidance and, in some cases, other methodologies adapted to their national context. The approaches taken vary depending on institutional and human capacities, cost, geography, time frame and data availability.

126. Although recent national reports include more information about methodologies used to determine adaptation needs, overall there is still more information about the methodologies used to determine mitigation needs than for adaptation needs. The types of methodology applied vary. Most methodologies used to identify mitigation needs are quantitative, while a lower number of qualitative methodologies are used to identify adaptation needs. However, in recent reports some countries have used methodologies to identify both mitigation and adaptation needs.

127. Countries in the Africa, Asia-Pacific, and Latin America and Caribbean regions present regional-level information about methodologies applied to determine mitigation needs. Countries in the Africa and Asia-Pacific regions also present information about methodologies used to determine adaptation needs.

128. UNFCCC reporting guidelines and guidance, such as those provided for TNA preparation, have facilitated identification of needs for technology transfer and capacity-building related to mitigation and adaptation actions through methodologies such as the TNA methodology and the guidance for preparing a TAP.[35] However, the existing reporting guidelines and guidance do not include specific provisions on how to assess these needs at the local level. As such, countries assess their needs on the basis of methodologies developed for application at the national or international level.

129. Methodologies used by developing countries to determine mitigation needs include both top-down and bottom-up models for the energy and non-energy sectors. Bottom-up models are suited for studying options that have specific sectoral and technological implications. Top-down models are useful for studying broad macroeconomic and fiscal policies for mitigation, such as carbon or other environmental taxes. Methodologies applied to identify mitigation needs mainly focus on the cross-cutting, energy, greenhouse gas inventory preparation, waste, transport, agriculture, forestry, building and industry sectors.

130. Methodologies used by developing countries to determine adaptation needs mostly include vulnerability assessments that determine the levels of risk and

35) Technology Executive Committee. 2020. *Enhancing implementation of the results of technology needs assessments*. Bonn: UNFCCC. Available at https://unfccc.int/ttclear/tec/brief13.html.

vulnerability for each sector. These methodologies mainly focus on the agriculture, ecosystem and biodiversity, water and cross-cutting sectors.

131. For international and regional reports, top-down methodologies have been developed and applied to identify finance, technology development and transfer, and capacity-building needs. Such reports have provided alternative methodologies to developing countries that have been adapted to national circumstances and contexts and used to determine national needs.

4.2 Introduction

132. In national reports, methodologies refer to the set of tools applied to characterize actions, activities and needs. Since 1992, developing countries have been communicating their needs and priorities under the UNFCCC process through various channels. The coverage and quality of information on needs and the methodologies applied to determine needs has increased over time; more detailed information is provided in recent reports – including information on the costs of specific technology needs.

133. The main criteria that countries use to characterize needs relate to the climate change impacts and vulnerabilities in specific sectors and the measures needed to reduce GHG emissions at the sectoral level. Developing countries have primarily used NCs and BURs to report on progress at the national level and to identify needs to address climate change and implement the Convention. Work conducted in the context of NAPs and the ACs have served to further identify needs related to adaptation. TNAs and TAPs have also helped in the process to identify needs related to technology development transfer and capacity-building, and the preparation of NDCs has been useful in identifying further needs, including financial needs.

134. The analysis of national reports suggests that developing country Parties use different methodologies to identify, determine and communicate their needs. Furthermore, many countries have expressed the need to build capacity in the use of methodologies for data collection, including for estimating, assessing, determining and communicating needs related to tackling climate change.

135. The methodological steps used in assessing and determining needs vary in the amount of detail in the reports of developing country Parties and are commensurate with the guidelines related to the nine national reports. The first part of this chapter attempts to identify and characterize common methodologies applied by developing country Parties in their national reports to determine needs. The second part presents methodologies applied in regional and global reports. While this chapter characterizes common methodologies identified, Annex E includes a list of methods identified in national reports, and Annex F presents methods identified in regional and global reports, including key features, assumptions and sources.

4.3 Overview

136. While in earlier reports submitted under the Convention more methodologies were applied to determine mitigation needs, primarily for the characterization of emissions by sector using the IPCC methodologies, in later reports methodologies were applied to determine adaptation needs. Of the methods used to determine actions and needs, 59 per cent were mitigation related, 31 per cent were adaptation related and 10 per cent related to cross-cutting needs with both mitigation and adaptation impacts.

137. The type of methodologies used varies among countries. Of the type of methods used by countries, 35 per cent were quantitative, 21 per cent qualitative and 45 per cent combined both quantitative and qualitative approaches. The details, challenges and assumptions regarding application of the methodologies also varied among countries.

138. Quantitative methods were mostly applied to determine mitigation needs, particularly to define the amount of reduction in emissions and costs. In contrast, adaptation needs were mostly determined with qualitative methods, which describe processes. In recent reports, methodologies that use both approaches were increasingly applied. In the reports of some countries, information attributed to averting, minimizing and addressing loss and damage was included without providing information about the methodologies applied.

139. Except for developing countries in Western European and other States, all regions have applied more methodologies related to determining mitigation needs than for adaptation needs. Countries in the Africa, Asia-Pacific and Latin America and the Caribbean regions present region-level information about methodologies applied to determine mitigation needs. Countries in Africa and Asia-Pacific also presented information about methodologies used to determine adaptation actions and needs. In a growing number of reports from all regions, methods with a cross-cutting mitigation-adaptation approach were applied. Except for some specific sectors, data and information on the approaches and methodologies used to determine needs of developing countries relating to the implementation of the Convention and the Paris Agreement have not been collected systematically at the local, national, regional and global levels. Consequently, there is no comprehensive overview of what information is available and the gaps and limitations associated with estimations. Gaining a better understanding of the limitations of needs assessments provides the opportunity to enhance existing methodologies and gain a better understanding of developing countries' needs at the national and multilateral level, including needs by region, by thematic scope, and by sector.

4.3.1 Methodologies used at the national level by developing countries in national reports

140. This section introduces common methodologies used by developing countries to determine mitigation and adaptation needs, including methods to determine technology development and transfer, capacity-building and financial needs. First, mitigation methodologies are described, followed by adaptation methodologies. The analysis is based on the description of methodologies and underlying assumptions provided by developing country Parties in their national reports. In line with the guidelines or guidance for the various national reports, Information on underlying assumptions was in most cases limited. In some reports, countries expressed challenges and opportunities involved in the application of methodologies to determine needs.

Mitigation

141. As a first step to determine needs for mitigation actions, Parties define emission reduction goals, which range from quantitative goals (t CO2 eq/year), reducing the carbon intensity of the economy, focusing on the reduction per unit of GDP, goals based on LULUCF and unconditional and conditional goals.

142. Methodologies to characterize mitigation needs in national reports can be distinguished between top-down and bottom-up models for the energy and non-energy sectors. Bottom-up models are suited for studying options that have specific sectoral and technological implications. . Top-down models are useful for studying broad macroeconomic and fiscal policies for mitigation such as carbon or other environmental taxes (UNFCCC 2021). Common methodologies to determine mitigation needs follow approaches such as life-cycle assessment, analysis of cost effectiveness and co-benefits analysis. These approaches have also served in the development of specific tools such as LEAP, which has been widely used by developing countries to identify measures and needs, particularly in the energy sector. Examples of countries that have used methodologies and tools such as LEAP to determine needs include Albania, the Bahamas, Ecuador, Georgia, Jamaica, the Republic of Moldova and Serbia.

143. Methodologies incorporating modelling scenarios are used to characterize and determine mitigation needs based on, for example, GHG projections, climate targets, availability of technologies, and policies or mandates in place.

144. Qualitative methods tend to adopt multi-criteria indicators to prioritize the most relevant actions and needs. One example used to determine needs related to mitigation is socioeconomic analysis – this methodology considers specific economic and social factors to determine the feasibility and affordability of measures in a given period. Countries that have used this approach include Burkina Faso and Costa Rica.

145. Domestic MRV systems have also facilitated the determination of needs in developing countries. MRV systems have helped track progress in reducing sectoral emissions, which in turn have facilitated identification of needs that enable continuation or acceleration emission reductions. Examples of countries that have established MRV systems include Colombia, Morocco, Thailand and Viet Nam.

146. National reports where methodologies have been mostly applied to mitigation sectors include cross-cutting (47 per cent), energy (20 per cent), GHG inventory preparation (13 per cent), transport (5 per cent) and waste and sanitation (3 per cent).

147. The main challenges in determining mitigation needs relate to the certainty of data, the definition of specific needs at the project level, and, in particular, the estimation of the costs of implementing the measures in a given time frame. To overcome these challenges, some developing countries have identified the need for further guidance in determining needs in specific sectors.

Adaptation

148. Determining needs for adaptation actions relates to the approaches that countries follow to characterize their levels of vulnerability. Some of the approaches followed to express adaptation needs, as found in the analysis of national reports, are:

(a) "Adaptation-based" approach, associated with the measures to increase resilience to climate change impacts;
(b) "Impact-based" approach, associated with the climate change impacts already being experienced in countries, and related to loss and damage;
(c) "Vulnerability-based" approach, associated with the levels of vulnerability to climate events in specific sectors or populations;
(d) "Risk-based" approach, associated with the levels of risk identified in specific sectors or populations.

149. National reports such as BURs, NCs and NDCs present general information about the methodologies applied to determine adaptation needs. Adaptation-specific reports such as ACs, NAPs and NAPAs, through the guidance to prepare these reports, and the process of formulating and implementing them, have provided more specific guidance on methodologies to identify adaptation needs, including capacity-building and financial needs. TAPs and TAPs have also served to identify technology needs for adaptation, thanks to the methodological framework that they provide.

150. Some of the common methodologies utilized by countries to determine their adaptation needs include the following:

(a) Multi-criteria decision analysis, which is used to characterize selected sectors, identify and prioritize key measures on the basis of predetermined criteria such as cost-effectiveness. Examples of countries using this methodology are Armenia, Azerbaijan, Madagascar and Panama.
(b) Vulnerability assessments, where countries identify the most vulnerable sectors and, on that basis, develop and prioritize key adaptation measures for implementation. Examples of countries using vulnerability assessments are Belize, Colombia, Ecuador, Guinea and Haiti.
(c) Climate risk profile, where countries evaluate the likelihood of all relevant climate change-related risks on the basis of observed and climate data, estimate and future risk and identify measures to reduce anticipated risks. Examples of countries using this method are Burkina Faso, Ecuador and Samoa.

151. Developing countries have deviated from the national-level approach in designing their national adaptation actions (e.g. Angola, Cabo Verde, Cameroon and Kenya). In the determination of adaptation needs, some countries follow a bottom-up approach, where adaptation measures are developed at the local level, including through community-level actions.

152. The methodologies used to determine needs for adaptation actions vary across countries, even when a sectoral approach was followed. Most of the

methodologies to determine adaptation needs were related to cross-cutting sectors (65 per cent), agriculture (11 per cent), water (5 per cent) and ecosystems and biodiversity (4 per cent).

153. The determination of adaptation needs depends on the availability of information regarding the vulnerability of the identified sectors and territories and on the technical capacity of governments to implement specific measures. Other factors that determine countries' ability to identify adaptation needs are institutional and social factors, data availability that enables climate projections and scenarios for specific geographical areas, as well as associated costs.

154. One of the most common challenges identified in determining adaptation needs is the lack of information regarding the different levels of vulnerability to determine specific needs. Therefore, most of the analyses undertaken by countries tend to identify general needs for each sector. Another major challenge is estimating the cost of adaptation actions, which are, for the most part, long-term interventions.

Box 4.1

Case study: Identifying methodologies for adaptation needs in the Commonwealth

The Commonwealth Secretariat conducted an analysis to identify methodologies for assessing the adaptation needs of its member countries. The results of the analysis show that while members have developed policies related to adaptation, not all of them have followed the same methods to identify adaptation needs. Countries follow the international methods available, adapted to national circumstances. Belize, for instance, reported that it has applied an adaptation assessment methodology "that mainly depend on the response mechanisms, which are mainly linked to the existing institutional structures which are often oriented to sectors. Therefore, preferences have been given to sectoral adaptation needs assessments, which are included in National Climate Change Policy".

The Commonwealth Secretariat also found that as well as each country having different methods, different assumptions underpin those methods, which need to be studied case by case. In some countries there is more information than in others about the gaps and opportunities in the use of specific methods.

Sources: The Commonwealth (2021).

Box 4.2

Case study: Cross-cutting sector vulnerability assessment by Belize

According to its NC3, Belize applied a methodology for the cross-cutting sector involving matrix tables and qualitative relationship criteria to indicate synergies among sectors in order to assess both cumulative and reduced impacts and vulnerabilities.

The essential components of this integrated approach were:

(a) Interactions and feedback across multiple drivers and impacts;

(b) Policy options and some indication of costs, when available;

(c) Cross-sectoral interactions;

(d) Integration of climate drivers with non-climate drivers, and stakeholder discussions.

Source: Government of Belize (2016).

Means of implementation

Technology development and transfer

155. Due to the comprehensive guidance and methodologies provided for countries to prepare TNAs and TAPs, technology needs related to mitigation and adaptation actions are reported by countries in more harmonized ways. Although the TNA process provides a framework for assessing technology needs, countries do not always follow the same procedures and, therefore, the levels of granularity and disaggregation of information may be different.

156. While most countries identify specific technologies per sector, some countries also identify the cost of technology adoption. The sectors that have been identified most related to technology needs using the TNA methodology are energy, transport, industry and land use for mitigation and water, agriculture, forestry, coastal management, health, and ecosystems and biodiversity for adaptation. Examples of countries that have used the TNA methodology to determine technology needs are Azerbaijan, Belize, Bosnia and Herzegovina, El Salvador, Indonesia, Jamaica, the Republic of Moldova, Panama, Samoa, Thailand and Viet Nam.

157. Countries tend to prioritize strategic sectors to identify technology needs on the basis of the TNA methodology's multi-criteria analysis, which is based on:

(a) the magnitude of possible reductions in GHG emissions;
(b) economic and social considerations to determine the cost-efficiency of the measures (average costs and marginal capital expenditure and operation costs, opportunity costs and additional costs), macroeconomic aspects (GDP, number of jobs created or lost, impacts on inflation rates, exchange and foreign trade), as well as other economic advantages and disadvantages; and
(c) administrative, institutional and political considerations, such as the institutional capacity to carry out the necessary information gathering, monitoring, enforcement and authorization.

158. Regarding assumptions, the TNA assumes a cost–benefit analysis where each technology is evaluated against a range of criteria related to investment cost, productivity, income-generating potential and the potential to improve equity, respect of cultural rights, policy integration, institutionalization, and other criteria depending on the country's needs.

159. Challenges and barriers identified in the adoption and implementation of technologies related to regulations, incentives, technical capacity, the actual costs of technology adoption and the level of maturity of the technology.

Capacity-building

160. Owing to the lack of a common framework and methodologies, capacity-building needs varied among countries. When determining capacity-building needs, countries made use of information obtained through multi-criteria decision analysis, surveys and stakeholder consultation processes (see chapter 3 above).

161. The GCF country programmes have also supported cost estimation of specific activities, including adaptation actions. The methodologies used to determine capacity-building needs resulted in needs that were mostly concentrated on dissemination and sharing of information on capacity-building activities, capacity-building institutional strengthening, and identifying the costs of these activities for specific sectors.

162. Challenges identified by countries in determining capacity-building needs are related to availability of information from different levels of government, particularly local government and non-government stakeholders, including local and indigenous communities. Other challenges identified by developing countries relate to the policies and institutions in place and the limited capacity to cost capacity-building needs at different levels of government and society.

Box 4.3

Case study: Multi-criteria decision analysis to prioritize waste and livestock technologies for mitigation in Ecuador

According to the TNA/TAP joint report, the Government of Ecuador applied a multi-criteria decision analysis to prioritize technologies in different areas. This process took place by (1) defining the criteria for prioritization and then (2) scoring each criterion under each technology.

One to three prioritization criteria were divided into five categories: economic, socio-cultural, environmental, political and technological. The prioritization criteria and their scores were obtained by (1) defining and analysing the criteria within the technical commission framework with the consultative team; and (2) socializing the criteria with the actors who attended the workshop on technology prioritization and considering the prior identification of barriers.

Source: Government of Ecuador (2013).

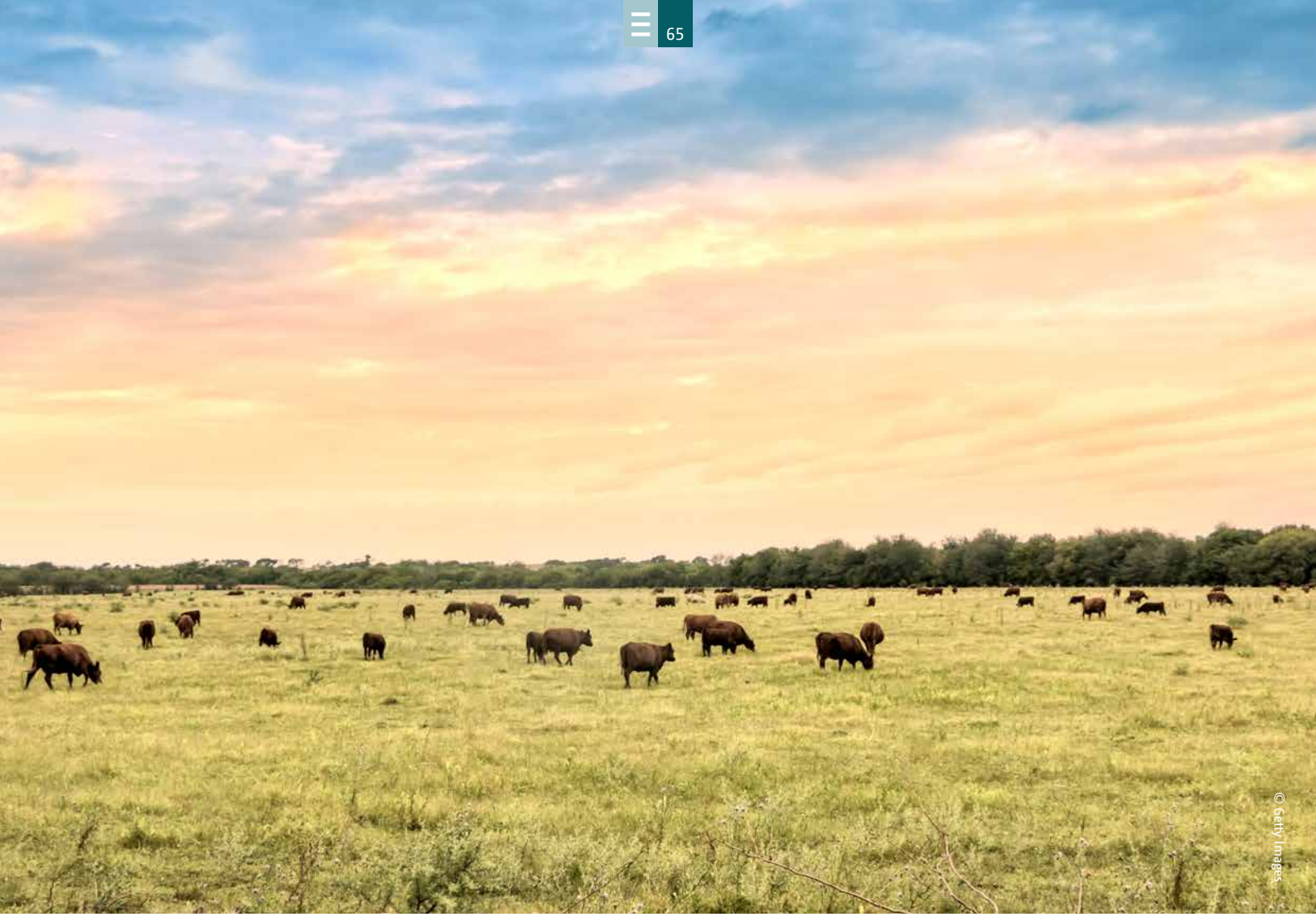
Box 4.4

Case study: Technology needs assessment methodology for adaptation in Samoa

A TNA for adaptation was used by Samoa for its NC2 to prioritize technologies, which were ranked against six criteria:

(a) Are fit for commercial application;
(b) Strengthen, rather than diminish, community resilience;
(c) Promote local industry and employment;
(d) Are culturally appropriate and promote gender equality;
(e) Comply with locally adopted infrastructure standards;
(f) Are cost-effective and self-financed over their life cycle.

Source: Government of Samoa (2010).



Finance

163. Descriptions of methodologies used to estimate costs and financial needs were included in a limited number of national reports. In some cases, the estimated costs and financial needs were included without further explanation of the methodologies used. This is in line with the reporting guidelines, where developing countries may present general information about financial support received in BURs and NCs, and present further information about financial needs in reports such as TAPs, TNAs, NAPs, NAPAs and NDCs. Although the methodologies used to determine financial needs are often presented by sector, some countries, mainly in their NDCs, estimate the cost of specific measures, for example, Dominica, the Dominican Republic, Kenya, Mexico, Nauru and North Macedonia.

164. Methodologies specifically developed to estimate the cost and financial needs of adaptation and mitigation action are limited. Some sectors where needs have been costed are related to energy, transport and land use.

165. Some countries use costs metric methods, such as levelized cost, which are applied by sector. These methods characterize the cost of mitigation actions and compare these costs for different technologies to measure their lifetime expenditure in order to ascertain a benchmark for comparing technologies and practices. Levelized cost has, for example, been applied in the energy sector to estimate the cost of conserved energy and determine future investment needs in the sector. The method is also applied to estimate the cost of conserved carbon, which can be used for comparing mitigation costs per unit of avoided emissions and comparing specific emissions reduction costs for different options by sector.

166. Other methods are based on models to project emissions scenarios by sector to identify specific technologies and the cost of such technologies. Models related to cost curves are also common approaches to assess and compare the cost of different measures in the short-, medium- and long-term. A common method is the marginal abatement cost curve, which is an abatement cost assessment graph indicating the marginal cost for varying amounts of emission reduction. Another model, the GACMO calculates current and future GHG emissions and the effects of climate actions. These methodologies can be applied at the project level to estimate a project's technology, human resources and other operational costs. Examples of countries that have used these methods are Ecuador, Mali, Nauru and North Macedonia.

Box 4.5

Case study: Estimation of costs for mitigation actions included in the NDC of Mexico

The Mexican Government estimated the costs associated with 30 mitigation measures included in its NDC (submitted in 2016). A disaggregated approach with a cost analysis method was used to determine the resources necessary to carry out projects from the planning phase and through their lifespan. The analysis comprised five phases:

(a) Design and description of the trend scenario: projects the trend behaviour of the emissions, as well as variables that determine these emissions in an environment of inaction, that is, where no action is taken against climate change;

(b) Design and description of the mitigation scenario or NDC scenario: indicates what would happen, ideally, when the measures are executed and includes the difference between emissions under the NDC scenario and trend emissions constituting the expected mitigation;

(c) Calculation of the costs associated with each of the scenarios: includes the accounting of costs of the elements in the trend scenario and in the NDC scenario;

(d) Calculation of net cost: net cost is defined as the difference between the cost of the measures to meet the NDC goals (gross cost) and the cost associated with the trend scenario;

(e) Calculation of mitigation cost: once the net cost is obtained, it is divided by the mitigation to obtain the average cost of mitigation, which indicates the cost (expenditure or saving) per tonne CO2eq mitigated.

Calculation of net cost: defined as the difference between the cost of measures to meet the NDC targets (gross cost), and the cost associated with the baseline scenario.

If the difference is positive, there is a positive net cost or net outlay to implement a certain mitigation measure.

If the difference is negative, it is understood that there is a negative net cost that represents a saving resulting from the implementation of the measure.

The analysis was based on several assumptions, including:

(a) To present costs in a way that contributes to comparability across sectors, the average mitigation cost was used, expressed in dollars per tCO2 eq mitigated;

(b) The time dimension was included in the cost estimates, through which it is possible to compare and aggregate the results, recorded annually, in the different sectors by applying the concept of present value, which explicitly incorporates the value of money in the time period;

(c) To estimate present value for all costs, a discount rate of 10 per cent was used, which reflects the cost of money over time, as authorized by the Ministry of Finance and Public Credit to evaluate social investment projects.

Source: Government of Mexico (2020).

167. The determination of financial needs has also been conducted to identify financial gaps at the national level. Some developing countries (e.g. Colombia and South Africa) have been or are in the process of setting up a national system for MRV of climate finance. Other countries have applied tagging systems such as the OECD Rio markers, the CPEIR and other international tagging methodologies to identify financial gaps and needs at the national level for mitigation needs and to a lesser extent adaptation needs.

168. The estimation of costs and financial needs is based on a number of assumptions in some reports, such as the cost of human resources involved for the implementation of such measures; currency rates; the cost of technology development and transfer, variation of the cost of technology according to the region where the measure will be implemented; and others that are not always calculated.

169. Financial needs analysis requires information on the cost and cost variability of each measure, programme, sector and governance level, and requires cost estimation over time. The main challenge associated with determining financial needs is limited access to information that would enable countries to apply methodologies by sector, project and over time. Therefore, some countries identified the need for further guidance to determine, articulate and communicate financial needs.

170. Preliminary analysis shows that developing country Parties included information in their national reports about loss and damage. At this stage it is not possible to highlight specific trends related to the methodologies to determine needs related to loss and damage. However, in general countries tended to add up quantitative costs for losses that had occurred in the past to project future losses.

Box 4.6

Case study: Estimation of the costs of renewable energy production in the Republic of Moldova

The Government of the Republic of Moldova elaborated an analysis in its NC 4 to estimate the cost of renewable energy production. The analysis considered:

(a) The cost of fuel purchased for renewable power production;

(b) The company operation and maintenance costs in year t related to the production and commercialization of renewable power. These include costs of labour, materials, third party services, other operation and maintenance costs, taxes and fees. For the first two years of activity, the companies present detailed materials necessary to determine their own operation and maintenance costs. Operation and maintenance costs accepted by the National Agency for Energy Regulation for year two of activity are considered as basic costs. For each of the following years, the basic costs are adjusted with the Moldova Consumer Price Index (i.e. for inflation) to the previous years and corrected with the efficiency factor (0.99 in the formula below);

(c) The cost of capital, comprising both depreciation of investments made and rate of return on net investments put into operation. The rate of return in per cent is calculated according to the following formula:

WACCe.t.t is the weighted average cost of capital determined and approved by the National Agency for Energy Regulation for the electricity distribution companies in year 't'. In 2008 it was 15.05 per cent and in 2009 14.24 per cent. Kt- is the multiplier coefficient applied for the generation of renewable energy and biofuel in year 't'.

It is established in the manner as following:

(a) For the first five years of activity (years 1-5) it shall be equal to 1.5;

(b) For the second five years of activity (years 6-10) it shall be equal to 1.3;

(c) For the third five years of activity (years 11-15) it shall be equal to 1.1.

Source: Government of the Republic of Moldova (2018).

Box 4.7

Case study: Colombia cost–benefit analysis for adaptation measures

In 2016 the Government of Colombia, in collaboration with the Economic Commission for Latin American and the Caribbean and the Inter-American Development Bank, elaborated a cost–benefit analysis of the adaptation measures related to the forest, livestock and water sectors. The analysis aims at efficient management of natural resources, the preservation of ecosystem services, the reduction of greenhouse gases and the implementation of good practices across sectors. According to the report, a cost–benefit ratios with values higher than one and competitive internal rates of return were obtained for all analysed adaptation measures, indicating that adaptation measures would be most effective in the above-mentioned productive sectors. However, since many of these benefits are difficult to monetize and social benefits are to be quantified, an incentive and accompanying policy is necessary for such measures to be effectively implemented.

Based on this and other analyses, the Government of Colombia updated its NDC in 2020, including a more comprehensive adaptation component that includes more concrete proposals for actions to mainstream climate change adaptation at different levels of country planning. The targets focus on areas such as: water resources, protection of terrestrial and coastal marine ecosystems, restoration, protected areas, infrastructure and agriculture.

In the presentation of the objective, description, baselines, milestones and measurement indicators, there is an emphasis on the financial needs to achieve the implementation of the adaptation measures and a specific amount of financial resources needed was not provided.

Source: Government of Colombia (2020).

4.3.2 Methodologies used at the regional and global level

171. At the regional and global levels, multilateral agencies, research institutes and think tanks have developed methodologies to characterize mitigation and adaptation needs and their related means of implementation (namely capacity-building, technology development and transfer, and finance). The estimation of climate action costs and climate change impacts is a growing area of study. Such studies and approaches vary according to thematic area, regional scope and sectoral coverage.

Mitigation

172. In the case of mitigation, there is not a single method that fits all needs analyses; however, the references provided by the IPCC are commonly used by developing countries to determine mitigation needs. The IPCC Special Report on Global Warming of 1.5 °C estimates that average annual investments in energy supply will range from USD 1.6 to 3.8 trillion (2010 USD) globally to 2050 (IPCC, 2018). The report refers to a dedicated multi-model comparison study (McCollum et al., 2018) that provides regional breakdowns of global energy-related investment needs. The additional investment, compared with baseline pathways, is estimated to be approximately USD 840 billion per year (range: 150–1,700 billion). Low-carbon energy supply investments, such as renewables, are projected to be the largest in developing countries in Asia.[36]

173. Other studies follow simulation models to assess the cost of transformational changes at the sectoral level. The IEA's World Energy Model, for example, is a simulation model covering energy supply, energy transformation and energy demand. Specific costs play an important role in determining the share of technologies in meeting energy demand under different scenarios. These include investment costs, operation and maintenance costs, fuel costs and in some cases, costs for emitting CO_2. Calculation of the investment requirements is based on assessing incremental capacity needs multiplied by unit capital cost estimates compiled for each component in the energy supply chain. Investment is measured as the ongoing capital expenditure in energy supply capacity, excluding spending that is usually classified as operation and maintenance. The IEA World Energy Model includes COVID-19 recovery packages and commitments announced as at mid-2020, with the IEA's Stated Policies Scenario assuming cautious implementation and its Sustainable Development Scenario integrating the packages and commitments comprehensively. Updated investment cost estimates have been included in the model for, among other applications, utility-scale solar photovoltaic projects and CCUS applications, the latter possibly being responsible for a sizeable downwards correction in the projected growth of other end-use investments compared with the 2018 report.

174. The IRENA created the Global Energy Transformation road map to 2050 in 2019. The agency estimated that to put the world on track with the objectives of the Paris Agreement, cumulative investment in renewable energy needs to reach USD 27 trillion in 2016–2050. IRENA's analysis was based on its socioeconomic footprint analysis, which provides "a comprehensive view of the transition process. It uses integrated models and indicators to measure the likely impacts in terms of GDP, employment and human welfare". This model also includes analysis of "the drivers and dynamics affecting the outcome provide valuable insights into how the overall transition process can be shaped to maximise these benefits and reduce the costs of adjustment" (IRENA, 2019; 2020).

175. Some studies, such as McCollum et al., have applied modelling tools to evaluate the costs, potentials and consequences of different energy, climate and human development futures over the medium to long term. However, the addressing of global energy investment needs is relatively uncommon, and multi-model exercises on the topic are even more uncommon. Each model has its own perspective, which varies on the basis of assumptions for socioeconomic development, technological change and policy choices. Models also have different structures and solution algorithms.

176. Other studies such as Rozenberg and Fay (2019), analyse how countries can afford the infrastructure they need while protecting the planet. These authors consider that the most common methodology used to estimate infrastructure investment needs relies on cross-country benchmarking that consists of looking at the average stock of infrastructure that countries typically have had at different levels of income, urbanization and economic structure. Instead, Rozenberg and Fay (2019) propose to price infrastructure investment needs using costing models. They use this approach for the access targets defined by the SDGs: universal access to safe water and sanitation, universal electrification, and improved access to rural transport.

36) Regional classifications are those used in the AR5 of the IPCC and are listed in Annex A.

177. IFC has a methodology for estimating climate-smart investment potential based on the World Bank's NDC database to filter the sector priorities and targets for each country of focus. Using these data, IFC creates a map of countries' sector coverage and responses outlined in the NDCs. IFC experts were consulted to better understand the policies and market conditions of each country.

Adaptation

178. There is no consensus on methods for assessing adaptation needs, or on the extent to which adaptation planning is adequate and effective in achieving its targets and objectives. Considering this, UNEP has assessed progress on adaptation planning, both quantitatively and qualitatively. Its analysis was based on existing assessments of adaptation planning, as well as the provisions of the Paris Agreement, including the objectives of the global stocktake. The analysis examined the overall number of national adaptation strategies, plans and laws, as well as the number of subnational and sectoral adaptation plans and strategies.

179. Miyamoto (2019) and Koks et al. (2019) illustrate the economic issue of adapting infrastructure (new construction or rehabilitation) to specified risks. The additional cost depends on the risk, type of asset, and asset location. For example, increasing a road's resilience to flooding by improving the drainage system only adds a few per cent to its construction costs, while increasing the level of a railway line may increase costs by up to 50 per cent.

180. Recent studies have analysed the cost of not being resilient. Studying over 3,000 scenarios, Hallegatte et al. 2019 found that in most of them, it is costly to delay global action on resilience to 2030, with potential losses at a median value of USD 1.0 trillion. Adding climate change into these scenarios almost doubles the median cost of delaying action for 10 years.

181. ECLAC has compiled estimates of the actual and potential costs of adaptation processes. Based on a selection of the types of infrastructure in developing countries in different parts of the world and a careful identification of potential risks (changes in temperature and precipitation), the average overall economic costs of adaptation for all sectors range from USD 4 to 100 billion per year (AILAC, 2020).

182. A Joint Research Centre report for the European Union studied critical infrastructure damages from climate extremes and key investments in the energy, transport, industrial and social sectors, which at present reach EUR 3.4 billion per year. The report revealed that damages could triple by the 2020s, multiply sixfold by mid-century, and amount to more than 10 times the present damages by the end of the century (Forzieri et al., 2016).

183. Kovarik et al., G20 (2020) suggest that a systematic resilience review is needed in the cost–benefit analysis of infrastructure projects, and should therefore (1) be based on economic concepts using a holistic approach to risk management; (2) identify the various risks and relevant socioeconomic and environmental data to be collected and structured; (3) transparently identify the short-, medium- and long-term benefits of adaptation, and; (4) facilitate the identification of sustainable solutions (i.e. those that both contribute to the SDGs and specifically increase infrastructure asset durability while remaining adaptable to a range of possible environmental and social use changes) to increase infrastructure resilience.

184. IMF uses a database on the share of exposed assets to estimate country-level public investment needs for upgrading and retrofitting physical infrastructures in response to natural hazards. Natural hazards considered are floods and cyclones (droughts and temperature changes are excluded). The share of exposed assets is derived from cross-referencing two global maps of natural hazards and road and railway assets (Koks et al., 2019). Public and private investment projections and public capital stock are drawn from IMF's World Economic Outlook and its Investment and Capital Stock Dataset with unit costs applied in accordance with Rozenberg and Fay (2019) and incremental cost averages taken from Miyamoto International (2019). Unit costs are set at 15 per cent for upgrading and 50 per cent for retrofitting. Infrastructure projects considered for upgrading activities are all sectors subject to hazards (energy, water, transportation and social sector facilities). Further, previously unreported country-level estimates of coastal protection investment needs from Rozenberg and Fay (2019) are presented, which were derived from global high-definition representations of coastal zones and the DIVA climate model in accordance with Nicholls et al. (2019). Investments for the economically optimal level of protection are reported, minimizing the sum of protection costs and residual flood damage to assets until 2100. Average specifications are used for socioeconomic projections, unit costs and GHG concentration pathways.

185. The World Bank has conducted an assessment to identify the future cost of climate change impacts in the Pacific region, using different methods for different sectors to adapt them to the case of the Pacific region, pointing out the necessity to consider that external and internal factors may change over time, producing an effect in the estimates provided.

Box 4.8

Case study: Estimating Costs of Adaptation (World Bank)

An analysis conducted by the World Bank to assess the future cost of climate change impacts in the Pacific region highlights that this is challenging for at least three reasons.

(a) First, there are deep uncertainties on the speed and intensity of climate change, especially at the local level. There are large differences between the projections of different climate models that do not seem to be diminishing with time. Given the small size of the PICs and the extensive ocean-dominated areas where they are located, downscaling changes in climate and natural hazards at the country level gives an even wider range of potential changes. In addition, even if models were perfectly accurate, uncertainty would not disappear because future levels of greenhouse gas emissions, which by nature cannot be forecasted, largely determine future climate change.

(b) Second, climate change impacts will depend on the socioeconomic choices made by countries for the next few decades. It will be much costlier to adapt to climate change in a society which heavily depends on agriculture production, with high poverty rates, inequalities and poorly managed infrastructure, than in an inclusive society with safety nets and resilient infrastructure.

(c) Third, the costs and benefits of adaptation are determined by the framework that is used to assess them and the objectives that are set. For instance, the best adaptation strategy will be different in a cost–benefit analysis where the objective is economic efficiency than if the objective is a defined acceptable level of risk.

Despite all these challenges, the WB proposed five methods to calculate estimates of adaptation costs in the Pacific region based on different studies and models:

(a) Selecting "no-regret" strategies that yield benefits even in the absence of climate change. Examples of no-regret strategies include reducing leaks in water distribution systems, increasing the standards of new buildings, or increasing the frequency of road maintenance.

(b) Favouring reversible and flexible options, like insurance, early warning systems or easy-to-retrofit coastal defences.

(c) Buying "safety margins" in new investments, with, for instance, restrictive land-use planning, higher flood defences or bigger drainage capacity for urban infrastructure and roads.

(d) Promoting soft adaptation strategies, including the "institutionalization" of long-term planning exercises and financial instruments.

(e) Reducing decision time-horizons. In areas that could be flood-prone in the future, building cheaper houses with a shorter lifetime can make sense. The best adaptation strategies depend on the local context and are likely to be a mix of these options.

Source: World Bank (2016).

186. At the international level, initiatives such as the NAP Global Network aim to support countries in elaborating their NAPs, as well as in identifying their needs.

187. There is a growing interest in understanding needs at the national level. These needs have been studied by international organizations such as the OECD, through its financial climate futures, and by international think thanks such as the Overseas Development Institute, through its national climate finance analysis. Regional initiatives also aim to better understand financial needs at the country level.

188. There are growing efforts to identify needs at the local level, including with the use of methodologies to assess adaptation needs (e.g. the assessing climate change adaptation framework of LoCAL) and methodologies related to climate finance (e.g. the performance-based climate resilience grants of LoCAL and the cities climate finance leadership alliance promoted by ICLEI-Local Governments for Sustainability) (LoCAL, 2020a,b).

189. According to the Women and Gender Constituency (Gender CC, ICCAD, WECF, LIFE) other methodologies related to adaptation such as community-based adaptation, technology transfer mechanisms and capacity building methods, should include a gender perspective to be more effective. The constituency proposes the use of the gender impact assessment and monitoring tool (2018) to be considered in the determination of needs (WEDO, 2020).

190. External reports suggest the importance of including gender considerations in the determination of needs, but no methodologies were identified for conducting such analyses, beyond the processes mentioned in chapter 3 above.

Chapter V

Challenges, opportunities, and gaps in determining the needs of developing country Parties

5.1 Key findings

191. There are several regional and global specialized institutions that can support countries in their needs identification process by providing expertise and data. Some of these institutions are United Nations agencies, to which countries have quick and easy access and which can be engaged with during the needs identification process to provide the required support.

192. A number of platforms have been established by various institutions, including United Nations agencies and MDBs. These platforms offer a good opportunity for developing countries to share their experience and good practices in the needs identification process. Most developing countries are already using these platforms to share their experience.

193. Several initiatives have been established that can help in the needs identification process. These initiatives include the establishment of emissions inventories, which provide some of the data and information that can facilitate the prioritization of sectors and activities as part of the country's climate change needs identification process.

194. Country case studies have shown that the needs identification process provides an opportunity for countries to translate their needs into investment opportunities and climate actions, including by using existing support mechanisms to prioritize and cost identified needs and turn needs into project ideas for support. For example, through the TNA process, some countries identified technology support needs and submitted a request for technology assistance to formulate project ideas related to technology development and transfer.

195. Costing adaptation and mitigation needs for action is becoming a crucial area of work at the national level in order to better identify gaps where financial support is needed and ways to leverage public and private resources.

196. Institutional coordination was highlighted as a major challenge in the needs determination process. The coordination challenge affected needs identification between sectors and between levels of governance, namely the local and national level. Two of the identified drivers of limited coordination was the lack of specialized institutions within ministries with the mandate to spearhead climate change actions, and the involvement of ministries other than the environment ministry in climate change planning in the needs identification process.

197. While most countries have used methodologies to identify and report their needs both qualitatively and quantitatively, costing these needs has been a major challenge and therefore most of these needs do not have accompanying cost estimates. This challenge

is particularly evident in deriving cost estimates for climate adaptation and enhancing resilience needs, and, in this context, deriving cost estimates for averting, minimizing and addressing loss and damage needs, since developing countries' adaptation actions cannot always be included in short-term projects, but rather require long-term interventions that are difficult to estimate in monetary value.

198. Developing countries have taken significant steps to improve their needs determination process but capacity gaps within lead institutions continue to hinder progress. These capacity gaps vary widely across countries and include the lack of qualified personnel to spearhead the needs identification process and the lack of institutional-level capacity.

199. Limited availability of granular data at the sector and subsector level constitutes one of the major gaps identified by developing countries. As a result, many developing countries provide cost estimates for overall needs rather than as thematic or sector disaggregates.

200. The lack of specialized national institutions to spearhead the means of implementation under the Convention, such as technology development and transfer, and capacity-building, limits the ability of some developing countries to track needs continuously and identify additional and emerging needs.

201. Limited detailed guidance on the structure and content of reports submitted to the UNFCCC resulted in needs with varying levels of detail across countries. Where such guidance was available, for instance for TNAs, the needs were identified at a higher level of detail compared with needs communicated in other national reports.

202. For most countries, climate change needs are aligned with the targets set out in the 2030 Agenda for Sustainable Development. As the SDGs are ideally indivisible, all developing country Parties covered in this report are taking action to address SDG 13 that relates to taking action to address climate change, and SDG 13 affects all the other SDGs. Overall, the needs identified by developing countries touch on all SDGs, with 75 per cent of NDCs having linkages to SDGs 2, 6, 7, 8, 9, 11, 12, 13, 15 and 17.

203. In their national reports, some developing country Parties refer to the AAAA provision for mobilizing and aligning local resources for climate action. This is particularly evident in countries that capture their climate action budgets under the national budgeting process.

5.2 Introduction

204. This chapter discusses the challenges, opportunities and gaps developing countries experience in determining their climate change needs derived from the national reports prepared by countries and submitted to the secretariat. Additional challenges, opportunities and gaps were derived from reports developed by regional and global organizations that work closely with developing countries in determining their climate change needs.

205. Most developing countries have identified their climate change needs which have been captured and reported as part of the country's submission to the secretariat. However, these needs differ in their level of detail. Most of these needs cut across all means of implementation – finance, capacity-building, and technology development and transfer.

206. Most countries have submitted at least one report to the secretariat that highlights their climate change related needs. 19 out of the 154 countries have submitted fewer than three reports. Therefore, the challenges, opportunities and gaps reported in this chapter reflect the experiences developing countries encounter in their needs identification process.

5.2.1 Opportunities

207. One opportunity developing countries have when determining needs related to implementing the Convention and the Paris Agreement is to take advantage of the capacity enhancement platforms for needs identification that have been established by UN agencies and various MDBs such as the NAP Global Network or the Africa NDC hub established by the AfDB.

208. Other opportunities in the needs identification process include enhancing collaboration between governments and local and regional non-governmental specialized institutions to enhance the capacities of local experts. Enhanced collaboration would enable local lead institutions to gain the necessary experience and skills to support the needs identification process and related climate actions.

209. Making use of the resources from the operating entities of the Financial Mechanism of the Convention (the GCF and the GEF) to raise additional resources to enhance the needs identification process constitutes another opportunity. Financial resources are provided under the GCF Readiness Programme and the GEF CBIT.

5.2.2 Challenges

Challenges experienced in preparing the report

210. In compiling the needs of developing country Parties from the various sources, efforts were made by the technical team to overcome challenges such as identifying where reporting overlaps so as to avoid double counting in aggregating and presenting the data. Nevertheless, the following challenges were encountered in collecting, categorizing, aggregating and presenting the data on needs:

(a) **Data inconsistencies**: the classification of sectors and subsectors is not uniform across data sources, including in different sources of information and reports submitted by the same Party. This increases the risk of double counting as cost estimates may be given in one report by sector and in another report by activity, so the same activity may be captured and hence accounted for under the costs by sector. Issues related to the definitions of needs also introduce inconsistencies because needs are referred to as qualitative needs, investment needs or costs.

(b) **Data gaps**: gaps in the coverage of information on quantified needs by sector or subsector pose a significant challenge. These gaps are particularly evident for adaptation needs, which, compared with cost estimates for mitigation, remain limited. Significant data gaps related to capacity-building needs remain; these are predominantly characterized in qualitative terms. Further, information on methodologies used in producing and communicating information on needs in national reports is, in many cases, not included in the reports. In addition, methodological assumptions, which in most cases are not stated, may affect the interpretation of the data. The needs are dynamically changing and may depend on different factors such as temperature scenarios, mitigation pathways and adaptive capacity, extreme weather events, adverse effects of trade and economic barriers, and social factors such as poverty. Most reports, however, provide a snapshot of a Party's needs. It should also be noted that not all Parties have submitted reports.

(c) **Data interpretation**: when collecting, analysing and aggregating data and information on the needs of developing country Parties, best efforts have been made to ensure accuracy. When collecting and analysing the extent of needs reported by developing country Parties in their national reports, different Parties apply their respective definitions and interpretations of needs. Needs may be reported as needs or activities needed to take climate action. Furthermore, costed needs may be determined in one national report but not in the subsequent report, without stating whether the same amounts of costed needs apply.

211. The limitations outlined above need to be taken into consideration when deriving conclusions and policy implications from this report. The SCF will contribute,

through its activities, to help addressing these challenges, including by highlighting, through case studies, good practices and lessons learned by countries in determining their needs.

Challenges experienced by developing countries

212. In general, challenges related to capacity-building needs were frequently identified by developing countries, varying widely from institutional-level capacity to availability of local expertise. Regarding institutional-level capacity, the need to improve intersectoral and intrasectoral coordination for needs identification was highlighted as a major challenge by the majority of developing countries. The coordination challenge spans from the local to the national level. One of the cited drivers for this was the lack of specialized institutions within line ministries to spearhead climate change actions.

213. Most of the countries did not provide financial quantification of their needs, especially their adaptation needs. This suggests that estimating the cost of climate action is, for most countries, challenging, and particularly challenging is identifying and implementing methods to estimate costs. This challenge was partially attributed to the absence of accurate, complete and sufficient data and information to determine needs comprehensively. This challenge cut across all countries at different levels.

214. Another challenge was the low financing capacity of the public sector, occasioned by limited resources and several competing needs, therefore limiting the availability of funds to finance an elaborate needs assessment and prioritization exercise.

215. Limited technical capacity for collecting, processing, interpreting and reporting data, especially in building future scenarios for emission reduction commitments, was also a major challenge identified for the needs determination process. The limited capacity for tracking progress towards meeting the objective of the Convention and the purpose and goals of the Paris Agreement was another technical capacity challenge, limiting the countries' ability to identify gaps and needs that would enable or fast-track the achievement of the set targets.

216. Limited institutional capacity for coordinating climate actions, including the needs identification process, across both the public and the private sector, was also observed to be a major challenge. This challenge is compounded by the numerous sectors and institutions that spearhead climate relevant actions in both the private and the public sector within the complex framework of differentiated governance structures and levels.

217. Level of indebtedness can be a major barrier to a country in meeting its climate action ambition. This has been worsened by the COVID-19 pandemic, which has placed more demand on the limited resources available in developing countries. Most developing countries have a considerable debt burden, which when combined surpassed USD 8 trillion at the end of 2019 (Steele and Patel, 2000). This level of indebtedness is expected to significantly reduce the speed at which some climate actions can be implemented by developing countries.

5.2.3 Gaps

218. Gaps in policies and regulations and occasionally conflicting policies between sectors on climate action limit the ability of some countries to effectively coordinate the needs identification process across sectors.

219. Limited institutional coordination, and lack of specialized national institutions beyond the environmental sectors to spearhead the Convention's means of implementation (such as technology transfer and capacity-building) limits the ability of some developing countries to continuously track needs and to identify additional and emerging needs.

220. The lack of timely and updated information, which includes the availability of tools and systems for needs identification, limits the ability of some developing countries to identify and apply methods for quantifying their climate change needs accurately.

221. In order to improve climate action, including needs identification at the national level, the need to fill capacity gaps was identified as critical by most developing countries. This need for capacity-building spans across technical expertise, political insight, climate governance, knowledge management, planning, project development and execution, and other aspects. These needs are highlighted in the climate adaptation projects that developing countries submit to the Adaptation Fund, the GCF and the GEF.

222. The opportunities, challenges and gaps experienced by developing countries in the needs identification process are summarized in table 5.1. To better understand these opportunities, challenges and gaps, the information is presented under the three means of implementation with an additional column for transparency reporting.

Table 5.1

Opportunities, challenges and gaps experienced by developing countries in the climate change needs determination process

Capacity-building	Finance	Technology development and transfer	Transparency reporting
Opportunities			
Regional and global specialized institutions have the necessary expertise to support the needs identification process	Several institutions including the GCF and the GEF offer financial support for the needs identification process	Several regional and global institutions have tools (e.g. models) that support the needs identification process	National emission inventories can complement data and information available for needs identification
Platforms where countries can share experience and good practices on needs identification are already available across the regions	Most countries have the necessary expertise to provide financial estimates in their ministries of finance; these experts could support the needs identification process		Utilize the Capacity-building Initiative for Transparency for knowledge- and experience-sharing
	Turning needs identified into investment opportunities and climate actions		
Challenges			
Limited institutional coordination arrangements	Limited capitalization of lead institutions to effectively carry out the needs identification process	Significant upfront investment for the most available or appropriate tools for needs identification	Lack of capacity for data management
Limited human capacities to support the needs identification process	Limited capacities and updated information to quantify the cost of mitigation and adaptation measures	Limited human capacities to utilize available tools for the needs identification process	Lack of finance and expertise to develop sector-specific emission factors Lack of a universal climate finance definition to determine what counts and what does not count as climate finance in order to better estimate the financial gap
High staff turnover leading to loss of knowledge and expertise in needs identification		Inexistence of technology action plans to inform technology needs	
Gaps			
Lack of formal institutional structures to spearhead climate change matters, including the needs identification process, leading to poor coordination of actors	Minimal investment by governments in climate-related activities including the needs identification process occasioned by competing financial needs	Limited integration of climate change technology needs into the national science and technology development and innovation process, limiting the prioritization of technologies to be acquired to support the needs identification process	Lack of finance and expertise to develop sector-specific emission factors
		Limited research and development in GHG mitigation technologies, both conventional and new	Lack of an institutional and/or sectoral framework for GHG monitoring and reporting, limiting the quality of emission data that could inform the needs identification process

Table 5.1 (continued)

Opportunities, challenges and gaps experienced by developing countries in the climate change needs determination process

Capacity-building	Finance	Technology development and transfer	Transparency reporting
	Limited experience in the implementation of methods to quantify the cost of mitigation and adaptation measures, in order to determine the financial gap that developing countries face		Quality assurance and quality control procedures not incorporated into MRV systems, affecting how they are used and the results from their use, including in the needs identified
			Lack of activity data and country-specific emission factors (IPCC default values used) affecting the quality of data used to determine needs

5.3 Insights into determining needs using available resources: country case studies and experience

223. While the process of determining climate change needs can be a daunting task, there are examples of well-defined needs that use a sound methodological approach and local data that translates easily into investment opportunities and climate actions. They also tend to attract the desired technical support from specialized institutions. The following discussion highlights country-specific examples drawn from across various regions.

224. Several countries have identified technology support as part of their climate change needs and have submitted, for the first time, a technology assistance request (e.g. Bolivia (Plurinational State of), Cook Islands, Democratic Republic of the Congo, El Salvador, Equatorial Guinea, Gabon, Liberia, Mexico, Nauru, Sierra Leone, Sudan and Vanuatu). In addition, multi-

Box 5.1

Case study: Insights from Ethiopia's NDC

Ethiopia, through its NDC, is endeavouring to leapfrog to modern energy-efficient technologies in the transport, industry and building sectors. The country has also set a target to protect and re-establish forests because of the economic and ecosystem services they provide while sequestering significant amounts of CO_2 and increasing carbon stocks in landscapes. To achieve this target, Ethiopia seeks to support the development of energy-efficient appliances for the household sector – this sector accounts for 89 per cent of energy consumption in the country. To this end, the country has designed a technology assistance project to develop energy efficiency standards and a labelling programme to support the development of energy-efficient *mitad* (cookstoves for making Ethiopian Injera bread). This project has attracted support through the Technology Mechanism under the Convention.

Source: Government of Ethiopia (2020): *Ethiopia First NDC. Updated Submission*. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Ethiopia%20First/Ethiopia%27s%20NDC%20update%20summary%202020.pdf

Box 5.2

Case study: Insights from Sri Lanka's NDC

In **Sri Lanka's** NDC, one of the identified needs is to build the climate resilience of sectors such as health, water management, and urban infrastructure and settlement, which are vulnerable to the adverse impacts of climate change. The country identified Kurunegala as one of the cities most vulnerable to climate change impacts, as it is especially vulnerable to landslides and water shortages. A capacity development initiative was undertaken to support city planners and policymakers in implementing measures identified to mitigate the identified impacts. This initiative has attracted support under the Technology Mechanism.

Source: Government of Sri Lanka (2016). *Sri Lanka First NDC.* Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Sri%20Lanka%20First/NDCs%20of%20Sri%20Lanka.pdf.

Box 5.3

Case study: Insights from Peru's NDC

One of the needs identified by **Peru** is to encourage and promote actions and projects that increase the availability of water in the context of climate change and those that promote comprehensive land management, specifically oriented towards increasing the resilience of forests and reducing their vulnerability. The country, with support from the Technology Mechanism, developed technical and strategic management plans for the protected areas. These plans included recommendations for mainstreaming ecosystem-based adaptation in budgeting processes, and area managers received capacity-building training to enable them to effectively implement the plans. This initiative is expected to decrease climate change vulnerability for approximately 15 per cent of Peru's population.

Source: Government of Peru (2020): *Peru First NDC*. Updated submission. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Peru%20First/Reporte%20de%20Actualizacio%CC%81n%20de%20las%20NDC%20del%20Peru%CC%81.pdf.

Box 5.4

Case study: Insights from the Solomon Islands' NDC

One of the climate change needs identified by the **Solomon Islands** is to reduce its GHG emissions by 12 per cent below the 2015 level by 2025 and by 30 per cent below the 2015 level by 2030, compared with a 'business as usual' scenario. The NDC includes a further commitment, conditional on international support, of a 27 per cent reduction in GHG emissions by 2025 and a 45 per cent reduction by 2030 compared with the 'business as usual scenario'. To achieve this, the country aims to reduce its energy usage and increase the share of renewable energy in its national grid. For one project, the country received assistance from the Technology Mechanism to identify more sustainable energy solutions to run its water and wastewater pumping facilities. The assistance supported the development of detailed energy audits to identify relevant energy efficiency and renewable energy options for the water authority, and included the preparation of feasibility reports, technical specifications and training manuals.

Source: Solomon Islands Government (2016): *Solomon Islands.* First NDC. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Solomon%20Islands%20First/SOLOMON%20ISLANDS%20INDC.pdf.

country collaboration forums on technology needs have been initiated with the aim of accelerating the meeting of countries' technology needs. These forums have generated multi-country technical assistance requests to the Climate Technology Centre and Network, mainly for renewable energy sectors such as geothermal direct use applications, for developing the Framework for Energy Efficiency Act in Kenya and for exploring the concept of centres of excellence for renewable energy testing protocols.

Box 5.5

Case study: Insights from South Africa's NDC

In several communications as part of the UNFCCC process, **South Africa** has prioritized increasing the renewable energy share of its national electricity generation. This follows its identification of the energy sector as a major contributor to the country's overall GHG emissions. After identifying this need, which was also articulated in the country's NDC, the country endeavoured to access climate finance to facilitate this investment. As at 2018, the country had been the most successful in sub-Saharan Africa in mobilizing climate finance: it had mobilized more than USD 488 million, mostly from the Clean Technology Fund. This finance was geared towards supporting the largest energy-generating company in the country to make additional investments in renewable energy generation.

Source: Government of South Africa (2016): *South Africa First NDC*. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa.pdf.

5.3.1 Costing adaptation needs

225. Some developing countries have identified their adaptation needs through the NAP process. The resulting needs and priority actions differ significantly across countries, and they cover a wide range of adaptation outputs and activities, from high-level actions that enable a country to achieve the desired adaptation outcomes (for which general descriptions are provided) to specific large-scale projects (for which details are provided).

226. Most countries have requested assistance to strengthen various capacities aligned with improving their ability to respond to adaptation challenges. These capacity needs are aimed at helping them move from broad priorities to a pipeline of strong project proposals, which is a critical step in building national adaptive capacity.

227. The cost of adaptation for developing countries has historically been underestimated owing to some of

the challenges highlighted above. For instance, in 2014 the IPCC, through its AR5, estimated that the annual climate adaptation cost for developing countries will be USD 70–100 billion between 2010 and 2050, but subsequent studies have indicated that this figure is a significant underestimate. New estimates suggest the real cost of adaptation for developing countries might be twofold to threefold higher than the previous estimate for 2030 and fourfold to fivefold higher by 2050 (UNEP, 2016).

228. Most developing countries have prioritized adaptation needs in agriculture, water, health, coastal zones, ecosystems and biodiversity, and forestry. Coastal zones and agriculture have the most detailed costing information. Further support has been requested to better quantify the costs associated with the different aspects of adaptation action and specific activities.

229. The cost estimation of climate mitigation and adaptation actions is becoming a crucial area of work at the national level in order to better identify (1) the areas where more financial support is needed, (2) what areas can be covered with national resources as part of a country's unconditional measures, where they exist, and (3) ways to leverage private and international resources, and on the basis of national assessments, to increase the effectiveness of such resources. Colombia, for example, has created an MRV system for climate finance and is now analysing the costs of actions to track potential investment gaps.

5.3.2 Evolving nature of needs

230. After ratifying the Paris Agreement, several countries raised their ambition on mitigation and adaptation targets and made formal requests to upgrade their NDCs before 2020. These countries include Argentina, Benin, the Bahamas, Belize, Indonesia, Sri Lanka, Morocco, Mali, Nepal, Uruguay and Venezuela (Bolivarian Republic of).

231. Morocco strengthened its target by increasing its unconditional emission reduction from 13 to 17 per cent and its conditional emission reduction from 31 to 41 per cent from the 'business as usual' scenario. Argentina changed its target type to a fixed-level target, not exceeding net emissions of 483 MtCO2 eq by 2030. This change of target type enhanced the target by removing uncertainties associated with the baseline setting. Nepal enhanced its NDC by including an additional target of expanding its renewable energy generation to cover 20 per cent of its energy mix. Sri Lanka set out to convert its existing fuel oil-based power plants to liquified natural gas.

232. In adaptation, several countries added details and targets, for instance, Benin added a five-year timeline to its sectoral contributions for adaptation. Mali added information on its 2020–2030 adaptation needs and actions required, which was an addition to the needs and actions captured in the INDC for 2015–2020. These additions included costs estimates for 2020–2030.

233. The same trend of increased ambition is noted in other NDCs submitted in 2020 with revised targets. Chile, Ecuador, Grenada, Mongolia, the Republic of Moldova, Rwanda and Suriname have increased their emission reduction targets and have improved on the level of detail provided for the actions they will take to achieve these targets.

234. This trend is also observable under the adaptation theme, where more developing countries are including adaptation targets in their revised NDCs. For instance, Rwanda, under its updated and ambitious NDC, committed to focusing on building adaptive capacity in human settlements, health, transport and mining, supported by sector-specific implementation plans, costing and funding mechanisms, and links with the SDGs.

5.3.3 Gender and inclusivity

235. The Paris Agreement recognizes the importance of taking into consideration vulnerable groups and communities and makes specific reference to using gender-responsive approaches and respecting the rights and knowledge of indigenous peoples. In most documents reviewed for this report some attention was given to these groups, but the data on gender dimensions being integrated fully in needs determination processes are limited. Less than a quarter of the NDCs reference gender or women, while less than a fifth reference indigenous peoples. However, a number of countries made specific reference to their commitment for gender-responsive climate actions. The remainder of this section presents several examples.

236. Chile, in its updated NDC, added the section "Social pillar of just transition sustainable development". This pillar identifies gender equality as an enabler for accelerated climate action and sets clear targets on monitoring gender inclusivity.

© Getty Images

237. In its NC3, Albania devoted a chapter to mainstreaming gender in climate change adaptation and mitigation. The chapter was developed through a consultative process with diverse stakeholders, including gender experts, and culminated in a workshop identifying challenges evident as obstacles to mainstreaming gender in national climate processes.

238. Burkina Faso has demonstrated a commitment to including gender considerations across its climate action. This is demonstrated in the country's NAP, wherein gender-based vulnerability to climate change due to existing gender inequalities is highlighted. The NAP also highlights the importance of continuing with participatory and gender-sensitive approaches to adaptation actions and notes the role of women's associations and civil society in promoting these approaches. Burkina Faso also integrated gender considerations in both mitigation and adaptation under the second TNA.

239. Kenya has adopted a "whole-of-society" approach to its commitment. The country's NAP has a focus on "gender, vulnerable groups and youth" and outlines the Government's commitment to achieving gender equity in all aspects of society, particularly in addressing climate change.

5.4 Co-benefits related to addressing the needs of developing country Parties, in relation to the Sustainable Development Goals, disaster risk reduction and the Addis Ababa Action Agenda

240. The adoption of the 2030 Agenda for Sustainable Development with its 17 SDGs, the Paris Agreement, the Sendai Framework for Disaster Risk Reduction 2015–2030 and the AAAA initiated a consistent vision of sustainable development. These guiding documents have much in common and are interrelated. In the 2030 Agenda, SDG 13, on climate action, references the UNFCCC processes and links explicitly to NDCs and NAPs in target 13.2 and its associated indicators. In addition, the 2030 Agenda links to the Sendai Framework and disaster risk reduction planning in target 13.1, and to the importance of capacity-building in targets 13.3 and 13b. Target 13a focuses on climate finance mobilization, setting a target of USD 100 billion per year by 2020 to support developing countries in implementing their climate actions. The AAAA sets a global framework for financing sustainable development and aligning its financing frameworks with national climate actions. It also emphasizes domestic

resources, private finance and international public finance, including ODA on sustainable development financing as well as sources of finance for climate actions.

241. In the national reports reviewed as part of the analysis for this report, several countries highlighted key drivers that exacerbate climate vulnerabilities. Most of these drivers, which include economic dependence on agriculture, population density and growth, poverty and low human development, land-use and land-cover change, and environmental degradation, are also the central themes under the 2030 Agenda, clearly demonstrating the interlinkages between climate change needs and the SDGs. While climate action can reduce vulnerabilities and spur sustainable economic growth centred on low-carbon development, a move towards sustainable development can reduce climate vulnerabilities.

242. In a 2017 report developed jointly by the United Nations Executive Office of the Secretary-General and the UNFCCC, the linkages between NDCs and achievement of the SDGs in developing countries, as well as opportunities for South–South cooperation and triangular cooperation, were identified (UN EOSG and UNFCCC, 2017). The report revealed many areas of co-benefits between NDCs and the commitments of governments under the Paris Agreement. These linkages included promotion of clean energy (which is captured as a climate change need by 99 per cent of developing countries in their NDCs), LULUCF (65 per cent), transport (60 per cent), waste management (66 per cent) and the mitigation aspects of agriculture (65 per cent). Overall, the needs identified by developing countries touch on all SDGs, with 75 per cent of NDCs having linkages to SDGs 2, 6, 7, 8, 9, 11, 12, 13, 15 and 17.

243. The alignment of developing countries' priority climate change needs and the SDGs is clearly captured under various country plans, projects and programmes. A report by the World Resources Institute found strong alignment between countries' priority climate action and the 2030 Agenda for 154 out of the 169 SDG targets (Northrup et al., 2016). Even though there is little mention of the SDGs in most countries' communications to the secretariat, the alignment of identified needs and the SDGs is clear.

244. More than half of developing countries have identified the critical role landscape conservation and biodiversity play in building climate resilience for communities. As such they have created strong links between their national biodiversity strategies and action plans developed under the Convention on Biological Diversity and their adaptation needs. The cross-border nature of some of the critical biodiversity hotspots in developing countries creates the opportunity for cross-border collaboration between countries, which is a key focus of SDG 17.

245. More than half of developing countries have considered the benefits of nature-based solutions in addressing their adaptation needs. National biodiversity strategies and action plans emphasize the potential and importance of nature-based solutions in addressing the vulnerability of species and ecosystems to climate change and other anthropogenic pressures. Nature-based solutions are considered as a resilience-building approach in several sectors, including infrastructure, energy, water, agriculture and urban planning. These considerations are closely linked to countries' national biodiversity strategies and action plans.

Box 5.6

Case study: Co-benefits to addressing the needs of Fiji in relation to the Sustainable Development Goals

In its NAP, **Fiji** outlines how the needs and actions identified contribute to each of the 17 SDGs. To name a few, achieving SDG 1, eradicating poverty, implementation of the NAP should ensure that all low-income and otherwise disadvantaged groups have equal rights to economic resources, as well as access to financial and basic services. Efforts to reduce the spread of tropical diseases and non-communicable diseases is aimed, among others, to contribute to SDG 3, ensure healthy lives and promote well-being for all at all ages. Water-related needs and actions outlined in the NAP are expected to contribute to ensuring sustainable withdrawal and supply of fresh water to address water scarcity and to substantially reduce the number of people suffering from water scarcity, as outlined in SDG 6, ensure availability and sustainable management of water and sanitation for all. Regarding SDG 7, its NAP envisages actions to ensure universal access to affordable, reliable and modern energy services, including through increasing the share of renewable energy. Strengthening resilience and adaptive capacity to environmental and climate-related hazards and natural disasters is expected to contribute to achieving SDG 13, take urgent action to combat climate change and its impacts. Links between the NAP and the remaining SDGs are contained in Fiji's NAP.

Source: Republic of Fiji (2018): *National Adaptation Plan. A pathway towards climate resilience.* Available at: https://www4.unfccc.int/sites/NAPC/Documents/Parties/National%20Adaptation%20Plan_Fiji.pdf.

246. Developing countries have established strong links between their national biodiversity strategies and action plans and climate adaptation and risk reduction, especially under the GCF country programme pipeline. These links are particularly evident in projects proposed by governments in their GCF country programmes that relate to (1) risks in coastal areas, addressed through the restoration and protection of coral reefs; (2) the mitigation of flooding risks, addressed through upstream ecosystem restoration and the establishment of green spaces in urban areas; (3) temperature extremes, addressed through the establishment of green spaces in urban areas; and (4) the mitigation of drought risks, addressed through improved agro-practices and watershed management among others (GCF Board, 2018).

247. International development partners have captured the intersections and interdependencies of the climate change and development agendas. For example, the Stockholm Environment Institute convened stakeholder dialogues to discuss alignment between the 2030 Agenda and climate action. Several countries engaged in the dialogues, including Cambodia, Ethiopia, Uganda, the United Republic of Tanzania, Viet Nam and Zambia. The dialogues focused on pursuing climate-compatible development policies, documenting the development benefits of implementing NDCs, identifying the priorities and challenges of adapting to climate change, and devising strategies for addressing trade-offs between climate and development agendas (Dzebo, 2019).

248. A review of country studies (Bangladesh, Nepal and Pakistan) undertaken under the CPEIR supported by the World Bank and UNDP highlights examples of countries' national climate change action plans, including those with sectoral targets, being incorporated in the national budgeting process. Viet Nam's national budget incorporates significant mitigation considerations in energy and infrastructure as part of building resilience as a result of strong recommendations for budget allocation contained in its National Target Program to Respond to Climate Change.

249. A number of developing countries have already taken up the opportunity of linking COVID-19 recovery with climate action. For instance, Costa Rica is working to link COVID-19 recovery with its national decarbonization plan and Rwanda has developed guidelines for small business to "green" their operations as part of its COVID-19 stimulus package.

Box 5.7

Case study: Co-benefits to addressing the needs of Morocco in relation to the Sustainable Development Goals

Morocco highlights that its NDC is part of an integrated approach towards achieving sustainable development as envisioned in its National Strategy for Sustainable Development. As such, the needs and actions identified in its NDC collectively contribute to achieving the SDGs, particularly SDG 1, 6, 7, 8, 9, 11, 12, 13 and 17.

Source: *Government of Morocco (2016): First NDC.* Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Morocco%20First/Morocco%20First%20NDC-English.pdf.

Box 5.8

Case study: Co-benefits to addressing the needs of Sri Lanka in relation to the Sustainable Development Goals

In its NAP, **Sri Lanka** states that the NAP should assist the nation to achieve the broader goals of SDGs, and the SDGs contribute to adapting to the adverse impacts of climate change. As such, Sri Lanka illustrates, in tabular format, how the adaptation actions and associated needs for each action identified in its NAP contribute to the respective goals and targets of the SDGs, particularly SDG 1, 2, 3, 6, 11, 13, 14 and 15.

Source: *Government of Sri Lanka (2016). Climate Adaptation Plan for Climate Change Impacts in Sri Lanka.* 2016-2025. Available at: https://www4.unfccc.int/sites/NAPC/Documents%20NAP/National%20Reports/National%20Adaptation%20Plan%20of%20Sri%20Lanka.pdf.

Box 5.9

Case study: Co-benefits to addressing the needs of Saint Vincent and the Grenadines in relation to the Sustainable Development Goals

Saint Vincent and the Grenadines sets its NAP in the context of achieving the 2030 Agenda, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction. Specifically, it highlights that without addressing the needs identified in its NAP, Saint Vincent and the Grenadines will not be able to achieve SDG 2 because climate change threatens to reduce productivity and the NAP can contribute to strengthening the resilience of the agriculture sector and ensure food security. More specific links between Saint Vincent and the Grenadines' NAP, climate change and each SDG are mapped out in an annex to its NAP.

Source: *Government of St. Vincent and the Grenadines (2019): National Adaptation Plan for St. Vincent and the Grenadines.* Available at : https://www4.unfccc.int/sites/NAPC/Documents/Parties/FINAL%20NAP_SVG_Approved.pdf.

ANNEXES

Annex A. Country and institution groupings used in the first report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement (2020)

Non-Annex I Parties (154)			
Afghanistan	Democratic Republic of the Congo	Liberia	Samoa
Albania	Djibouti	Libya	San Marino
Algeria	Dominica	Madagascar	Sao Tome and Principe
Andorra	Dominican Republic	Malawi	Saudi Arabia
Angola	Ecuador	Malaysia	Senegal
Antigua and Barbuda	Egypt	Maldives	Serbia
Argentina	El Salvador	Mali	Seychelles
Armenia	Equatorial Guinea	Marshall Islands	Sierra Leone
Azerbaijan	Eritrea	Mauritania	Singapore
Bahamas	Eswatini	Mauritius	Solomon Islands
Bahrain	Ethiopia	Mexico	Somalia
Bangladesh	Fiji	Micronesia (Federated States of)	South Africa
Barbados	Gabon	Mongolia	South Sudan
Belize	Gambia	Montenegro	Sri Lanka
Benin	Georgia	Morocco	State of Palestine
Bhutan	Ghana	Mozambique	Sudan
Bolivia (Plurinational State of)	Grenada	Myanmar	Suriname
Bosnia and Herzegovina	Guatemala	Namibia	Syrian Arab Republic
Botswana	Guinea	Nauru	Tajikistan
Brazil	Guinea-Bissau	Nepal	Thailand
Brunei Darussalam	Guyana	Nicaragua	Timor-Leste
Burkina Faso	Haiti	Niger	Togo
Burundi	Honduras	Nigeria	Tonga
Cabo Verde	India	Niue	Trinidad and Tobago
Cambodia	Indonesia	North Macedonia	Tunisia
Cameroon	Iran (Islamic Republic of)	Oman	Turkmenistan
Central African Republic	Iraq	Pakistan	Tuvalu
Chad	Israel	Palau	Uganda
Chile	Jamaica	Panama	United Arab Emirates
China	Jordan	Papua New Guinea	United Republic of Tanzania
Colombia	Kazakhstan	Paraguay	Uruguay
Comoros	Kenya	Peru	Uzbekistan
Congo	Kiribati	Philippines	Vanuatu
Cook Islands	Kuwait	Qatar	Venezuela (Bolivarian Republic of)
Costa Rica	Kyrgyzstan	Republic of Korea	Viet Nam
Côte d'Ivoire	Lao People's Democratic Republic	Republic of Moldova	Yemen
Cuba	Lebanon	Rwanda	Zambia
Democratic People's Republic of Korea	Lesotho	Saint Kitts and Nevis	Zimbabwe
		Saint Lucia	
		Saint Vincent and the Grenadines	

UN regional groups of Member States				
African States (54)	**Asia-Pacific States (52)**	**Eastern European States (23)**	**Latin American and Caribbean States (33)**	**Western European and other States (29)**
Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe	Afghanistan, Bahrain, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Cyprus, Democratic People's Republic of Korea, Fiji, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Malaysia, Maldives, Marshall Islands, Micronesia (Federated States of), Mongolia, Myanmar, Nauru, Nepal, Oman, Pakistan, Palau, Papua New Guinea, Philippines, Qatar, Republic of Korea, Samoa, Saudi Arabia, Singapore, Solomon Islands, Sri Lanka, Syrian Arab Republic, Tajikistan, Thailand, Timor-Leste, Tonga, Turkmenistan, Tuvalu, United Arab Emirates, Vanuatu, Viet Nam, Yemen	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czechia, Estonia, Georgia, Hungary, Latvia, Lithuania, Montenegro, North Macedonia, Poland, Republic of Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Ukraine	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of)	Andorra, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland, United States of America

Note: For the purposes of this report Cook Islands, Kiribati, Niue and the State of Palestine are geographically included in the Asian-Pacific States and are Non-Annex I Parties, however not member states of the United Nations.

Source: Department of General Assembly and Conference Management: Regional groups of Member States, available at: https://www.un.org/dgacm/en/content/regional-groups.

Least Developed Countries (47)				
Afghanistan	Chad	Kiribati	Nepal	Timor-Leste
Angola	Comoros	Lao People's Democratic Republic	Niger	Togo
Bangladesh	Democratic Republic of the Congo	Lesotho	Rwanda	Tuvalu
Benin	Djibouti	Liberia	Sao Tome and Principe	Uganda
Bhutan	Eritrea	Madagascar	Senegal	United Republic of Tanzania
Burkina Faso	Ethiopia	Malawi	Sierra Leone	Vanuatu [a]
Burundi	Gambia	Mali	Solomon Islands	Yemen
Cambodia	Guinea	Mauritania	Somalia	Zambia
Central African Republic	Guinea-Bissau	Mozambique	South Sudan	
	Haiti	Myanmar	Sudan	

Source: UN list of Least Developed Countries (as of February 2021), available at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdfb.

[a] As of 4 December 2020, Vanuatu has graduated from LDC status.

SIDS that are Member States of the United Nations (38)			
Antigua and Barbuda	Fiji	Micronesia (Federated States of)	Sao Tome and Principe
Belize	Grenada	Nauru	Solomon Islands
Bahamas	Guinea-Bissau	Palau	Suriname
Bahrain	Guyana	Papua New Guinea	Timor-Leste
Barbados	Haiti	Saint Kitts and Nevis	Tonga
Cabo Verde	Jamaica	Saint Lucia	Tuvalu
Comoros	Kiribati	Saint Vincent and the Grenadines	Vanuatu
Cuba	Maldives	Samoa	Seychelles
Dominica	Marshall Islands		Singapore
Dominican Republic	Mauritius		Trinidad and Tobago

Source: UN: Small Island Developing States. UN Members. Available at: https://sustainabledevelopment.un.org/topics/sids/list.

African Development Bank – country groupings				
Central Asia (7)	**East Africa (13)**	**North Africa (6)**	**Southern Africa (13)**	**West Africa (15)**
Cameroon	Burundi	Algeria	Angola	Benin
Central African Republic	Comoros	Egypt	Botswana	Burkina Faso
Chad	Djibouti	Libya	Eswatini	Cabo Verde
Congo	Eritrea	Mauritania	Lesotho	Côte d'Ivoire
Democratic Republic of the Congo	Ethiopia	Morocco	Madagascar	Gambia
Equatorial Guinea	Kenya	Tunisia	Malawi	Ghana
Gabon	Rwanda		Mauritius	Guinea
	Seychelles		Mozambique	Guinea-Bissau
	Somalia		Namibia	Liberia
	South Sudan		Sao Tome and Principe	Mali
	Sudan		South Africa	Niger
	Uganda		Zambia	Nigeria
	United Republic of Tanzania		Zimbabwe	Senegal
				Sierra Leone
				Togo

Source: AfDB: *Country groupings*, available at: https://www.afdb.org/en/countries.

Asian Development Bank – country groupings		
East Asia & Pacific (13)	**Europe & Central Asia (2)**	**South Asia (7)**
China	Armenia	Bangladesh
Fiji	Georgia	Bhutan
Hong Kong SAR		India
Indonesia		Maldives
Kiribati		Nepal
Malaysia		Pakistan
Mongolia		Sri Lanka
Papua New Guinea		
Philippines		
Republic of Korea		
Singapore		
Thailand		
Viet Nam		

Source: ADB (2017). *Meeting Asia's Infrastructure Needs*. Manila. Available at: https://www.adb.org/publications/asia-infrastructure-needs.

International Energy Agency – regional groupings							
Africa (30)	**Central and South America (23)**	**Eurasia (9)**	**Europe (43)**	**Middle East (12)**	**North America (3)**	**Other Asia (6)**	**South East Asia (10)**
Algeria, Angola, Benin, Botswana, Cameroon, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Gabon, Ghana, Kenya, Libya, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, South Africa, South Sudan, Sudan, Togo, United Republic of Tanzania, Tunisia, Zambia, Zimbabwe, and other African countries and territories	Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Curaçao, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of), and other Central and South American countries and territories	Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan, Uzbekistan	Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kosovoa, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Republic of Moldova, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland	Bahrain, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen	Canada, Mexico, United States of America	Bangladesh, Democratic People's Republic of Korea, Mongolia, Nepal, Pakistan, Sri Lanka, Chinese Taipei, and other Asia-Pacific countries and territories	Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam

Source: IEA (2020): *World Energy Model Documentation*. Available at: https://iea.blob.core.windows.net/assets/bc4936dc-73f1-47c3-8064-0784ae6f85a3/WEM_Documentation_WEO2020.pdf.

[a] This designation is without prejudice to positions on status, and is in line with United Nations Security Council resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

IPCC – regional groupings				
Asia (25)	**Latin America and the Caribbean (31)**	**Middle East and Africa (66)**	**OECD90+EU (47)**	**Reforming Economies of the Former Soviet Union (12)**
Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, China Hong Kong SAR, China Macao SAR, Democratic People's Republic of Korea, India, Indonesia, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Sri Lanka, Taiwan, Thailand, Viet Nam, Timor-Leste	Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of)	Algeria, Angola, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kenya, Kuwait, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Oman, Qatar, Réunion, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Syrian Arab Republic, Togo, Tunisia, Uganda, United Arab Emirates, United Republic of Tanzania, Western Sahara, Yemen, Zambia, Zimbabwe	Albania, Australia, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, Cyprus, Czechia, Denmark, Estonia, Fiji, Finland, France, French Polynesia, Germany, Greece, Guam, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, New Caledonia, New Zealand, Norway, Poland, Portugal, Romania, Samoa, Serbia, Slovakia, Slovenia, Solomon Islands, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland, United States of America, Vanuatu	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Source: McCollum et al. (2018): *Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable Development Goals. Supplementary Data 2.* Available at: https://www.nature.com/articles/s41560-018-0179-z#Sec20.

International Renewable Energy Agency – regional groupings								
East Asia (7)	**Latin America and the Caribbean (32)**	**Middle East and North Africa (19)**	**North America (3)**	**Oceania (8)**	**Rest of Asia (16)**	**Rest of Europe (15)**	**South East Asia (9)**	**Sub-Saharan Africa (46)**
China, Democratic People's Republic of Korea, Japan, Mongolia, Republic of Korea	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of)	Algeria, Bahrain, Djibouti, Egypt, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen	Canada, Mexico, United States of America	Australia, Fiji, Micronesia (Federated States of), New Zealand, Papua New Guinea, Samoa, Solomon Islands, Vanuatu	Afghanistan, Armenia, Azerbaijan, Bangladesh, Bhutan, India, Kazakhstan, Kyrgyzstan, Maldives, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkey, Turkmenistan, Uzbekistan	Albania, Andorra, Belarus, Bosnia and Herzegovina, Iceland, Liechtenstein, Monaco, Montenegro, North Macedonia, Norway, Republic of Moldova, Russian Federation, Serbia, Switzerland, Ukraine	Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam	Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe

Source: IRENA (2019): *Transforming the energy system*. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Sep/IRENA_Transforming_the_energy_system_2019.pdf.

World Bank Group – country or economy groupings
For Water and Sanitation, Irrigation, and River Flood Protection

East Asia and Pacific (24)	Europe and Central Asia (21)	Latin America and the Caribbean (27)	Middle East and North Africa (11)	South Asia (8)	Sub-Saharan Africa (46)
American Samoa, Cambodia, China, Democratic People's Republic of Korea, Fiji, Indonesia, Kiribati, Lao People's Democratic Republic, Malaysia, Marshall Islands, Micronesia (Federated States of), Mongolia, Myanmar, Palau, Papa New Guinea, Philippines, Samoa, Solomon Islands, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, Viet Nam	Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Hungary, Kazakhstan, Kosovo a, Kyrgyzstan, North Macedonia, Montenegro, Republic of Moldova Romania, Serbia, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan	Argentina, Belize, Bolivia (Plurinational State of), Brazil, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Venezuela (Bolivarian Republic of)	Djibouti, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Lebanon, Libya, Morocco, Syrian Arab Republic, Tunisia, West Bank and Gaza, Yemen	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Oman, Sri Lanka	Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe

Source: Rozenberg and Fay (2019).

[a] This designation is without prejudice to positions on status, and is in line with United Nations Security Council resolution 1244 and the International Court of Justice Opinion on the Kosovo Declaration of Independence.

World Bank Group – country or economy groupings For Energy (Global) and Transport (Global)			
Africa and Middle East (67)	**Asia, with the Exception of the Middle East, Japan, and the Former Soviet Union States (32)**	**Latin America and the Caribbean (33)**	**Reforming Economies of Eastern Europe and the Former Soviet Union (12)**
Algeria, Angola, Bahrain, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kenya, Kuwait, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte, Morocco, Mozambique, Namibia, Niger, Nigeria, Oman, Qatar, Réunion, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Syrian Arab Republic, Togo, Tunisia, Uganda, United Arab Emirates, United Republic of Tanzania, West Bank and Gaza, Yemen, Zambia, Zimbabwe	Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China (including Hong Kong SAR, China and Macao SAR, China, but excluding Taiwan, China), Democratic People's Republic of Korea, Fiji, French Polynesia, India, Indonesia, Lao People's Democratic Republic, Malaysia, Maldives, Micronesia (Federated States of), Mongolia, Myanmar, Nepal, New Caledonia, Pakistan, Papua New Guinea, Philippines, Samoa, Republic of Korea, Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Timor-Leste, Vanuatu, Viet Nam	Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay, US Virgin Islands, Venezuela (Bolivarian Republic of)	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Source: Rozenberg and Fay (2019).

International Monetary Fund – economy groupings		
Advanced Economies (35)	**Emerging Market Economies (42)**	**Low-income Developing Countries (52)**
Australia, Austria, Belgium, Canada, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong SAR, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Republic of Korea, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland, United States of America	Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Bahrain, Barbados, Belarus, Belize, Bolivia (Plurinational State of), Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Egypt, El Salvador, Eswatini, Gabon, Georgia, Guatemala, Guyana, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Malaysia, Mauritius, Mexico, Mongolia, Montenegro, Morocco, Namibia, North Macedonia, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russian Federation, Saudi Arabia, Serbia, South Africa, Sri Lanka, Suriname, Thailand, Timor-Leste, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uruguay, Venezuela (Bolivarian Republic of)	Afghanistan, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Haiti, Kenya, Kyrgyzstan, Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Republic of Moldova, Rwanda, Senegal, Sierra Leone, Solomon Islands, South Sudan, Sudan, Tajikistan, Togo, Uganda, United Republic of Tanzania, Uzbekistan, Viet Nam, Zambia, Zimbabwe

Source: International Monetary Fund (IMF). 2020. *Fiscal Monitor: Policies for the Recovery.* Washington, October. Available at: https://www.imf.org/en/Publications/FM/Issues/2020/09/30/october-2020-fiscal-monitor#Full%20Report%20and%20Executive%20Summary.

Annex B. Framework for collecting quantitative and qualitative data used in preparing the First Report on the Determination of Needs of Developing Country Parties related to implementing the Convention and the Paris Agreement

The country reports reviewed for the analysis include ACs, BURs, INDCs/NDCs, LEDS, NAPAs, NCs, TAPs and TNAs. Qualitative and quantitative information, such as the expression of needs in the form of programme or project lists and the description of planned activities in text or in tables were recorded in separate spreadsheets according to the sources (i.e. type of report). The needs were then categorized as per the categories listed in the table below. The categories were selected on the basis of expert judgment considering the description of activities, programmes and projects and the expression of needs in the reports. The list of sectors and subsectors is non-exhaustive, hence the need was marked as "unspecified" if the description did not contain sufficient information to allow the expert to make a judgment. Those activities marked as "other" are explored in the case studies prepared for the report.

Data on developing country needs were also collected from secondary sources covering the latest country reports and submissions received following the call for evidence by the SCF.

Category	Description
Applies to all spreadsheets	
Source	Reports are according to the mapping sources: BUR 1, BUR 2, BUR 3, (I)NDC 1, NDC 2, NAPs, NAPAs, NC1, NC2, NC3, NC4, NC5, NC6, TNA 1, TNA 1 Mitigation, TNA 2 Adaptation, TNA 2, TNA 2 Mitigation, TNA 2 Adaptation, TAP Mitigation, TAP Adaptation, TNA Barrier analysis and enabling framework, Long-term low-emission development strategies (LEDS), GCF country programmes
Country	Country name according to UN spelling
Region	Asia and the Pacific, Africa, Latin America and the Caribbean, Eastern Europe, Western Europe and other States
LDC group	LDC, Non-LDC
SIDS group	SIDS, Non-SIDS
Category area	Mitigation, Adaptation, Loss and damage, Cross-cutting, Unspecified
Sector and subsector	Mitigation – energy: renewable energy, energy efficiency
	Mitigation – forestry: forest fire prevention, reforestation, social forestry, forestry research
	Mitigation – agriculture: sustainable supply chain, rural development, urban/alternative agriculture
	Mitigation – land use: livestock, spatial planning
	Mitigation – transport: land transport, sea transport and air transport
	Mitigation – waste and sanitation: landfill, ocean waste
	Mitigation – household
	Mitigation – industry
	Mitigation – building and infrastructure
	Mitigation – GHG inventory
	Mitigation – other (includes fossil fuel subsidies, clean coal technology, and other mitigation measures unspecified above)
	Mitigation – cross-cutting or a combination of more than one subsector above.
	Adaptation – agriculture: agroforestry, fisheries and aquaculture, land and soil management, livestock, crop diversification/resistant crops, irrigation, water conservation

Category	Description
Sector and subsector	Adaptation – forestry: wildfires, sustainable forest management Adaptation – health: infrastructure (e.g. hospitals), air quality, extreme temperatures, health supply network, medical staff capacity Adaptation – ecosystem and biodiversity: wetland ecosystems, high land ecosystems, coastal and marine ecosystems, fresh water ecosystems Adaptation – coastal zone: coastal management, abrasion avoidance with mangroves, early warning in coastal areas Adaptation – water: flood warning, water distribution infrastructure (clean water, recycling, waste), water harvesting, water irrigation Adaptation – tourism: coastal tourism infrastructure, eco or nature-based tourism Adaptation – building and infrastructure: resilient housing, resilient building Adaptation – transport: land transport, sea transport and air transport Adaptation – disaster prevention and preparedness: flood and landslides, sea level rise, heat waves, public sector resilience, household resilience Adaptation: – risks/vulnerability assessments Adaptation – other (includes wildlife, energy adaptation, and other adaptation measures unspecified above) Adaptation – cross-cutting or a combination of more than one subsector above Cross-cutting: general, institutional arrangement, reporting, monitoring evaluation and learning Unspecified
Type of need	**Finance:** · **Finance:** financial support in the form of grant or loan to support climate change and its related development activities · **Investment:** financial placement in the short, medium and/or long term such as equity, foreign direct investment (FDI) and other means such as export credits to support production and trade related to the achievement of climate change targets **Technology development and transfer:** technological needs that can be directly and indirectly supported by overseas countries such as materials, technical assistance related to technology application, expert and engineer supports, copyright and patent grants **Capacity-building:** · **Technical assistance:** support by experts that can accelerate implementation · **Capacity-building for raising awareness:** includes all public campaigns to improve the general public's understanding of climate change · **Capacity-building for research:** includes improving of people's capacity to conduct research, such as through data collection, using and applying methods and writing research reports · **Capacity for education and training:** this includes formal and informal education and vocational trainings to improve skills and knowledge related to climate change and know-how · **Communication and dissemination of information:** includes the dissemination of information through various media and public platforms to different target audiences to convey specific messages related to climate change · **Determination of needs and their costs:** includes support to determine needs, to determine priorities in key areas such as technology, and to choose and apply methodologies to estimate the costs of needs · **Institutional strengthening and coordination:** includes the establishment of new institution(s) or assignment to existing institutions or some reform that takes place to accommodate the achievement of climate targets · **Policy development and regulation:** includes all support to assist policy development from scoping to piloting and drafting policy documents and assesses their effectiveness · **Monitoring, measuring, reporting, verifying and evaluating** **Cross-cutting:** select if includes more than one element above

Category	Description
Type of needed technologies (for TAPs and NAPs)	The description or examples of the most needed technology in specific sectors
Remarks	A blank cell to leave an important and clear note when columns do not accommodate the information (please keep the note clear and, concise, maximum two or three sentences)
Chapter 2	Data collection for stand-alone database (i.e. AC, BUR, LEDS, NAP, NAPA, NC, NDC, TAP, TNA)
Source of need	**National government:** includes all needs stated in the national reports unless stated explicitly as subnational or local government needs **Subnational government** includes all needs explicitly stated as subnational or local government needs. **Civil society:** includes civil society's needs as expressed by their own reports or by government reports **Private sector:** includes private sector companies' needs as expressed by their own reports or by the reports submitted by the government or civil society organization **Unspecified:** select if there is insufficient information to categorize using the options above
Description of need	Explanation of needed activities or actions and their objectives
Type of contribution (for NDCs only)	Conditional Unconditional Not specified
Description of contribution (for NDCs only)	Explanation of contribution
Time frame	**Before 2010** (select this if the activity time frame is unspecified and the report was submitted before 2010) **2010–2020** (select this if the activity time frame is unspecified and the report was submitted in 2010–2020) **2020/21–2030** (select this if the activity time frame is unspecified and the report was submitted in 2019 or 2000) **Beyond 2030** (select this if the activity time frame is specifically mentioned beyond 2030) Unspecified (select this if there is no sufficient information)
Time frame	<5 years 5–10 years > 10 years Unspecified
Total cost (USD billion)	The nominal amount of financial needs expressed in USD billion (total amount of cost supported by international finance and national effort)
Cost supported by international finance (USD billion)	The nominal amount expected to be covered by international government and non-government support (including by private sector and other actors) in USD billion
Cost covered by national effort (USD billion)	The nominal amount covered by national efforts (government and non-government efforts including by private sector and other actors) in billion USD
Method used to determine financial needs	Project list method: when Parties provide the list of projects with estimated costs Estimation method: when Parties provide the aggregate figures for a certain sector or objective Unspecified
Gender and vulnerable groups and other considerations addressed	Yes No Unspecified
Description of needs related to gender, vulnerable groups and other considerations	The description of needs to support the consideration of gender and vulnerable groups

Category	Description
Chapter 3	**Data collection for approach and processes**
Spread sheet title	**Approach and processes**
Process of institutional arrangements to determine needs	Ministry of environment (MoE)/focal point only Ministry of environment (MoE)/focal point with other ministries Interministerial committee Interministerial committee and stakeholder consultations
Process to determine needs considers gender aspects	Yes No Unspecified
Process to determine needs considers SDGs	Yes No Unspecified
Description of process to determine needs	Steps taken by countries to determine needs. This description can include how many levels in the country are involved in determining needs (only ministerial level, staff and officer level, provincial, municipal and village level). Can also explain how the information chain accommodates the flow between and among institutions (e.g. call for input online or offline, etc.)
Description of institutional arrangement to determine needs	Detailed explanation of the institutional arrangement in place for determining needs. This description can explain whether the decision to verify the needs and supporting data is taken in an ad hoc manner or is established by a group of constituents backed up by a formal policy, and whether this group is established specifically for determining needs on climate change or is part of the wider topics such as climate, development and SDG agendas
Description of approach to determining needs	Detailed explanation of ways of determining needs. This description can capture information regarding how data on needs are collected, such as whether the data are collected in closed meetings through a vertical chain of command or in an open environment and in a horizontal manner, and whether gender aspects, vulnerable groups, and other development goals in SDGs are included
Chapter 4	**Data collection for methods and assumptions**
Spread sheet title	**Methodologies assumptions**
Total cost (USD billion)	The nominal amount of financial needs expressed in USD billion
Type of analysis used to determine needs	Qualitative Quantitative Both
Method used to determine needs	Method to determine needs, such as Marginal Abatement Cost Curve (MACC), Priority Scoring Method, etc.
Brief explanation of the method	Explanation of the method and its key feature; for example, the key feature of MACC is a cross-sectoral comparison of abatement cost per unit of emission
Advantages of the method	The pros or advantages provided in the report (if any) – leave blank if unspecified
Disadvantages of the method	The cons or disadvantages provided in the report (if any) – leave blank if unspecified
Criteria used to select the method	Criteria used by the country to select the methods used or determined needs such as economic indicators, environmental index or other criteria that matter most for the country in determining needs – leave blank if unspecified
View of the country on the method used	Perspective of the country on the methods used; for example, how useful the method is and why other methods are not used (in other words, for example, why the country believes the method used is the most suitable) - leave it blank if unspecified

Category	Description
Assumptions provided	Yes No
Description of assumptions (if assumption provided)	Explanation of the assumptions of the method used to determine needs; for example, any economic indicator that is used and enabling environment that is considered
Chapter 5	**Data collection of challenges, opportunities and gaps**
Spread sheet title	**Challenges and opportunities**
Types of challenges related to determining needs	**Access to financial mechanisms:** financial shortage and access to additional financial sources **Organization of data and information on needs owned by government institutions** (self-explanatory) **Access to data and information on needs owned by the private sector** (self-explanatory) **Method for aggregation by the country:** includes inability of a country to aggregate data on needs owing to a lack of coherence of data or data are not being consolidated under a framework or organized institutional setting **Indebtedness and creditworthiness:** includes difficulties related to debts dealt by a country and its credit rating **Financing structure and cost:** includes a missing financial vehicle or underdeveloped financial instrument or structure for financial flows **Policy regulatory and institutional framework:** includes the arrangement of policies to support needs identification and channelling support **Financial market readiness:** includes the readiness of the enabling environment in the financial market to respond to financial needs in climate change or to complement international support **Investment environment:** includes the readiness of the enabling environment for the country to receive support or investment **Generation of data and information and its use for research** (self-explanatory) **Development of relevant knowledge and skills including oversight** (self-explanatory) **Development of human resources** (self-explanatory) **Physical barriers and mobility:** includes all challenges regarding the ability to reach remote areas to identify needs in that area **Lack of awareness:** includes a low level of the awareness of stakeholders needed to become involved in the needs identification process **Cultural barriers** (self-explanatory) **Other** (for all not mentioned above)
Description of challenges related to determining needs	Explanation of challenges (or framed as barriers or gaps) stated in the report (maximum five sentences)
Best practices to overcome challenges related to determining needs	Explanation of how well countries overcome challenges or barriers or gaps (past experiences; exclude future plan)

Category	Description
Type of opportunities related to determining needs	National – capacity-building to further determine financial needs
	National – improve knowledge creation to strengthen central and local capacities
	National – investment and trade
	National – job creation
	National – knowledge enhancement
	National – strengthen country partnership
	National – technological advancement
	National – other
	International and multilateral – international exposure
	International and multilateral – development co-benefits with SDGs, disaster risk reduction (DRR), Addis Ababa Action Agenda
	International and multilateral – financial support provided in response to needs
	International and multilateral – improve the exchange of best practices
	International and multilateral – other
Description of opportunities related to determining needs	Explanation of opportunities stated in the report (maximum five sentences)

Notes: NDC with the optimistic scenario is taken.
The annual estimated cost is not included unless the time frame is clearly stated.
The subsector is tagged as "mitigation other" or "adaptation other" or "general other" if it cannot be classified into the options and a note is left in the spreadsheet under "remark". This is later revisited during the analysis.

Annex C. Financial needs contained in national reports submitted as part of the UNFCCC process by country and type of report

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Afghanistan	Asia-Pacific States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	6	6	0.662	0.662	0.662	0.662	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	21	2	0.004	0.004	-	-	0.004	0.004	-	-	-	-
			NC	16	16	11.439	11.439	3.259	3.259	8.180	8.180	-	-	-	-
			NDC	56	15	10.761	10.761	0.066	0.066	10.695	10.695	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Albania	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	4	-	0.00	0.000	-	-	-	-	-	-	-	-
			NDC	2	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	57	24	0.394	0.394	0.372	0.327	0.022	0.022	-	-	-	-
Algeria	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	34	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	17	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	9	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Angola	African States	LDC	AC	21	21	0.144	0.144			0.144	0.144	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	15	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	29	29	44.095	44.095	43.951	43.951	0.144	0.144	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Antigua and Barbuda	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	38	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	30	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	24	24	2.400	2.400	2.200	2.200	0.200	0.200	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	5	-	0.000	0.000	-	-	-	-	-	-	-	-
Argentina	Latin American and Caribbean States		AC	24	-	0.000	0.000	-	-	-	-	-	-	-	-
			BUR	16	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	41	18	0.000	0.000	0.000	0.000	-	-	-	-	-	-
			NDC	58	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	6	4	0.007	0.007	0.007	0.007	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Armenia	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	25	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	25	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	20	16	0.124	0.124	0.123	0.123	0.001	0.001	-	-	-	-
			TNA	20	-	0.000	0.000	-	-	-	-	-	-	-	-
Azerbaijan	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	9	9	0.009	0.009	0.004	0.004			0.005	0.005	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	-	-	-	-	-	-	-	-	-	-	-	-
			NDC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	43	-	0.000	0.000	-	-	-	-	-	-	-	-
			TNA	14	13	22.024	22.024	4.601	4.601	17.423	17.423	-	-	-	-
Bahamas	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	62	4	0.007	0.007	-	-	-	-	-	-	-	-
			NDC	9	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Bahrain	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-		-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	18	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	19	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Bangladesh	Asia-Pacific States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	8	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	30	25	75.113	79.673	22.013	22.013	44.000	44.000	-	-	9.100	13.660
			NDC	34	22	69.050	69.050	27.050	27.050	42.000	42.000	-	-	-	-
			TAP	265	230	3.723	3.723	3.706	3.706	0.017	0.017	-	-	-	-
			TNA	23	6	4.018	8.018	4.000	8.000	0.018	0.018	-	-	-	-
Barbados	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	56	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	32	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Belize	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	29	29	0.006	0.006	0.006	0.006	0.000	0.000	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	45	11	0.046	0.046	0.010	0.010	0.018	0.018	0.018	0.018	-	-
			NDC	29	9	0.191	0.198	0.174	0.181	0.017	0.017	-	-	-	-
			TAP	19	19	0.005	0.005	0.002	0.002	0.004	0.004	-	-	-	-
			TNA	12	-	0.000	0.000	-	-	-	-	-	-	-	-
Benin	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	6	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	105	9	0.220	0.220	0.213	0.213	0.006	0.006	0.002	0.002	-	-
			NDC	24	24	0.012	0.012	0.006	0.006	0.006	0.006	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	11	-	0.000	0.000	-	-	-	-	-	-	-	-
Bhutan	Asia-Pacific States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	99	57	0.008	0.008	-	-	0.008	0.008	-	-	-	-
			NC	69	14	0.912	0.912	0.526	0.526	0.385	0.385	-	-	-	-
			NDC	57	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	39	38	0.025	0.025	0.004	0.004	0.020	0.020	-	-	-	-
			TNA	37	2	0.001	0.001	0.000	0.000	0.000	0.000	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Bolivia (Plurinational State of)	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	40	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	62	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	15	-	0.000	0.000	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	33	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	26	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	20	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Botswana	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	4	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	40	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	14	1	18.400	18.400	-	-	-	-	18.400	18.400	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	9	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Brazil	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	34	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	131	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	49	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	2	1	100.000	100.000	100.000	100.000	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Brunei Darussalam	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	18	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	16	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	
Burkina Faso	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	125	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	12	12	0.304	0.304	-	-	0.304	0.304	-	-	-	-
			NC	20	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	60	60	7.759	7.759	1.881	1.881	5.878	5.878	-	-	-	-
			TAP	27	-	0.000	0.000	-	-	-	-	-	-	-	-
			TNA	33	11	1.037	1.037	1.037	1.037	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Burundi	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	17	13	0.007	0.007	-	-	0.007	0.007	-	-	-	-
			NC	18	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	7	7	1.492	1.492	1.454	1.454	0.039	0.039	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	39	-	0.000	0.000	-	-	-	-	-	-	-	-
Cabo Verde	African States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	4	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	3	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	86	86	1.626	1.626	0.813	0.813	0.813	0.813	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	36	-	0.000	0.000	-	-	-	-	-	-	-	-
Cambodia	Asia-Pacific States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	65	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	38	1	0.865	0.865	-	-	0.865	0.865	-	-	-	-
			NAPA	94	94	0.319	0.319	-	-	0.319	0.319	-	-	-	-
			NC	3	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	96	79	4.216	4.217	2.132	2.132	2.085	2.085	-	-	-	-
			NAP	21	21	0.546	0.546	0.037	0.037	0.510	0.510	-	-	-	-
			TNA	13	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Cameroon	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	20	20	0.129	0.129	-	-	0.129	0.129	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	16	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	15	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Central African Republic	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	79	20	0.167	0.167	0.034	0.034	0.101	0.101	0.033	0.033	-	-
			NDC	4	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Chad	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Chile	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	98	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	32	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	73	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	25	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	15	4	0.005	0.005	0.005	0.005	-	-	-	-	-	-
China	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	44	2	8,464.329	8,464.329	4,836.759	4,836.759	3,627.570	3,627.570	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	41	41	8,464.329	8,464.329	4,836.759	4,836.759	3,627.570	3,627.570	-	-	-	-
			NDC	1	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	Latin American and Caribbean States		AC	30	-	0.000	0.000	-	-	-	-	-	-	-	-
			BUR	22	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	8	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	43	-	0.000	0.000	-	-	-	-	-	-		
			NDC	32	1	0.132	0.132	-	-	0.132	0.132	-	-		
			TAP	12		0.000	0.000	-	-	-	-	-	-		
			TNA	12		0.000	0.000	-	-	-	-	-	-		

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Comoros	African States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	79	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	26	1	0.675	0.675	0.375	0.375	0.300	0.300	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Congo	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	27	6	0.450	0.450	0.450	0.450	-	-	-	-	-	-
			NDC	16	26	5.874	5.874	5.325	5.325	0.487	0.487	0.062	0.062		
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	9	-	0.000	0.000	-	-	-	-	-	-	-	-
Cook Islands[a]	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	17	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	16	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Costa Rica	Latin American and Caribbean States		AC	2	-	0.000	0.000	-	-	-	-	-	-	-	-
			BUR	35	2	3.422	3.422	3.422	3.422	-	-	-	-	-	-
			LEDS	39	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	27	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	4	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	9	-	0.000	0.000	-	-	-	-	-	-	-	-
			TNA	9	-	0.000	0.000	-	-	-	-	-	-	-	-
Cote d'Ivoire	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	8	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	100	79	18.634	18.634	18.628	18.628	0.005	0.005	-	-	-	-
			NDC	108	16	17.641	17.641	13.246	13.246	4.395	4.395	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	74	49	0.172	0.172	0.123	0.123	0.048	0.048	-	-	-	-
Cuba	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	30	14	0.456	0.456	0.372	0.372	0.080	0.080	0.004	0.004	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	104	6	0.044	0.044	0.044	0.044	-	-	-	-	-	-
			NDC	23	22	13.788	13.788	13.788	13.788	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	5	5	2.411	2.411	2.411	2.411	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Democratic People's Republic of Korea	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	22	22	0.139	0.139	0.127	0.127	0.011	0.011	0.001	0.001	-	-
			NDC	6	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Democratic Republic of Congo	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	7	3	0.006	0.006	-	-	0.006	0.006	-	-	-	-
			NC	146	9	0.033	0.033	0.003	0.003	0.020	0.020	0.010	0.010	-	-
			NDC	5	4	12.500	12.500	12.500	12.500	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	34	27	0.064	0.064	0.054	0.054	-	-	0.010	0.010		
Djibouti	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	8	8	0.007	0.007	-	-	0.007	0.007	-	-	-	-
			NC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	37	37	6.400	6.400	5.400	5.400	1.000	1.000	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Dominica	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	17	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	24	8	0.123	0.123	0.098	0.098	0.025	0.025	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	88	-	0.000	0.000	-	-	-	-	-	-	-	-
Dominican Republic	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	21	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	24	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	41	41	17.633	17.633	8.917	8.917	8.716	8.716	-	-	-	-
			TAP	20	-	0.000	0.000	-	-	-	-	-	-	-	-
			TNA	20	-	0.000	0.000	-	-	-	-	-	-	-	-
Ecuador	Latin American and Caribbean States		AC	4	-	0.000	0.000	-	-	-	-	-	-	-	-
			BUR	23	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	69	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	5	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	70	36	0.021	0.021	0.000	0.000	0.021	0.021	-	-	-	-
			TNA	70	40	1.704	1.704	1.683	1.683	0.021	0.021	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Egypt	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	57	47	18.407	18.407	18.267	18.267	0.139	0.139	0.000	0.000	-	-
			LEDs	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	42	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	46	46	73.040	73.040	-	-	-	-	73.040	73.040	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	19	-	0.000	0.000	-	-	-	-	-	-	-	-
El Salvador	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	6	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	29	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	9	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Equatorial Guinea	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	7	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	13	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	44	16	3.941	3.941	3.673	3.673	0.115	0.115	0.153	0.153	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Eritrea	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	5	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	17		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Eswatini	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	28	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	15	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	26	-	0.000	0.000	-	-	-	-	-	-	-	-
Ethiopia	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	19	1	90.000	90.000	-	-	90.000	90.000	-	-	-	-
			NAPA	11	11	0.770	0.770	-	-	0.770	0.770	-	-	-	-
			NC	26	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	5	5	294.700	294.700	-	-	-	-	294.700	294.700	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	22	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Fiji	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	152	86	57.149	57.345	57.147	57.343	0.002	0.002	-	-	-	-
			NAP	157	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	102	102	7.945	7.945	0.381	0.381	4.554	4.554		-	3.010	3.010
			NDC	29	29	3.870	3.870	2.970	2.970	-	-	-	-	0.900	0.900
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Gabon	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	44	9	1.400	1.400	1.170	1.170	0.088	0.088	-	-	0.142	0.142
			NDC	37	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Gambia	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	10	10	0.015	0.015	-	-	0.015	0.015	-	-	-	-
			NC	13	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	33	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Georgia	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	25	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	50	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	3	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	12	-	0.000	0.000	-	-	-	-	-	-	-	-
Ghana	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	9	8	0.003	0.003	0.003	0.003			-	-		
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	39	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	27	27	22.594	22.594	9.813	9.813	12.781	12.781	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	8	-	0.000	0.000	-	-	-	-	-	-	-	-
Grenada	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	190	171	0.425	0.430	-	-	0.425	0.430	-	-	0.001	0.001
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	24	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	9	9	0.985	1.054	0.985	1.054	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	39	3	0.160	0.169	0.160	0.169	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Guatemala	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	39	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	2	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Guinea	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	12	12	0.008	0.008	-	-	0.008	0.008	-	-	-	-
			NC	118	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	10	10	8.270	8.270	6.500	6.500	1.770	1.770	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	29	-	0.000	0.000	-	-	-	-	-	-	-	-
Guinea - Bissau	African States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	60	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	14	14	5.600	5.600	-	-	5.600	5.600	-	-	-	-
			NC	68	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	6	3	0.742	0.742	0.700	0.700	0.042	0.042	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Guyana	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	29	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	24	24	1.600	1.600	-	-	1.600	1.600	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	17	-	0.000	0.000	-	-	-	-	-	-	-	-
Haiti	Latin American and Caribbean States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	45	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	31	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	17	17	25.387	25.387	8.773	8.773	16.614	16.614	-	-		
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	9	-	0.000	0.000	-	-	-	-	-	-	-	-
Honduras	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	49	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	100	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	37	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	58	58	0.104	0.104	0.008	0.008	0.097	0.097	-	-		
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
India	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	112	112	2500.000	2500.000					2500.000	2500.000	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	161	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	65	65	2500.000	2500.000	-	-	-	-	2500.000	2500.000	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Indonesia	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	41	5	247.220	247.220	247.220	247.220	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	67	19	4.191	4.191	4.191	4.191	-	-	-	-	-	-
			NDC	1	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	8	4	0.101	0.101	0.101	0.101	-	-	-	-	-	-
			TNA	21	5	2.178	2.179	0.000	0.001	2.178	2.178	-	-	-	-
Iran (Islamic Republic o)	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	156	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	17	17	210.000	210.000	70.000	70.000	140.000	140.000	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	111	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Iraq	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	53	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	42	6	136.541	136.541	-	-	136.541	136.541	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Israel	Western European and other States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	-	-	-	-	-	-	-	-	-	-	-	-
			NDC	5	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Jamaica	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	7	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	19	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	17	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Jordan	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	3	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	30	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	92	92	9.881	9.881	5.700	5.700	4.181	4.181	-	-	-	-
			TAP	110	87	0.873	0.873	0.106	0.106	0.766	0.766				
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Kazakhstan	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	48	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	1	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	189	189	11.186	11.186	0.141	0.141	11.045	11.045	-	-	-	-
			TNA	-		0.000	0.000					-	-	-	-
Kenya	African States		AC	9	9	43.930	43.930	-	-	43.930	43.930	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	20	20	37.822	37.822			37.822	37.822	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	29	8	16.120	20.820	16.120	20.820	-	-	-	-	-	-
			NDC	19	11	61.652	61.652	17.725	17.725	43.927	43.927	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	14	14	0.286	0.286	0.286	0.286	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Kiribatia[a]	Asia-Pacific States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	558	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	65	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	3	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	12	12	0.074	0.074	0.011	0.011	0.050	0.050	0.014	0.014	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Kuwait	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	14	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	56	4	0.022	0.022	-	-	0.022	0.022	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	52	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Kyrgyzstan	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	22	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	2	2	3.897	3.897	1.960	1.960	1.937	1.937	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Lao People's Democratic Republic	Asia-Pacific States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	12	-	0.000	0.000	-	-	-	-	-	-		
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	94	90	0.174	0.174	-	-	0.174	0.174	-	-	-	-
			NC	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	20	8	4.762	4.762	4.762	4.762			-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	25	-	0.000	0.000	-	-	-	-	-	-	-	-
Lebanon	Asia-Pacific States		AC	24	-	0.000	0.000	-	-	-	-	-	-	-	-
			BUR	6	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	14	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	44	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	64	27	0.036	0.036	-	-	0.036	0.036	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Lesotho	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	16	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	15	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	24	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Liberia	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	12	-	0.000	0.000	-	-	-	-	-			
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	5	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	24	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Libya	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	-	-	-	-	-	-	-	-	-	-	-	-
			NDC	-	-	-	-	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Madagascar	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	18	15	0.004	0.004	-	-	0.004	0.004	-	-	-	-
			NC	115		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	20	4	42.099	42.099	28.713	28.713	6.370	6.370	7.016	7.016	-	-
			TAP	37	33	2.073	2.073	0.811	0.811	1.262	1.262	-	-	-	-
			TNA	124		0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Malawi	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	15	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	124	3	0.007	0.007	0.001	0.001	-	-	0.006	0.006	-	-
			NDC	13	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	11	-	0.000	0.000	-	-	-	-	-	-	-	-
Malaysia	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	25	25	0.072	0.072	0.006	0.006	0.066	0.066	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	8	5	4.980	4.980	4.876	4.876	0.104	0.104	-	-	-	-
			NDC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Maldives	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	20		0.000	0.000	-	-			-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	12	12	0.108	0.108	-	-	0.108	0.108	-	-	-	-
			NC	17	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	65	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Mali	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	19	19	0.050	0.050	-	-	0.050	0.050	-	-	-	-
			NC	69	23	52.035	52.035	38.282	38.282	13.753	13.753	-	-	-	-
			NDC	40	14	48.366	48.366	34.680	34.680	13.686	13.686	-	-	-	-
			TAP	15	15	2.853	2.853	1.304	1.304	1.549	1.549	-	-	-	-
			TNA	22		0.000	0.000	-	-	-	-	-	-	-	-
Marshall Islands	Asia-Pacific States	SIDS	AC	8		0.000	0.000	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	18		0.000	0.000	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	9		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	26		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Mauritania	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	17		0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	16		0.000	0.000	-	-	-	-	-	-	-	-
			NC	42		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	29	29	18.673	18.673	9.300	9.300	9.373	9.373	-	-	-	-
			TAP	150	81	3.155	3.155	0.559	0.559	2.596	2.596	-	-	-	-
			TNA	26		0.000	0.000					-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Mauritius	African States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	22		0.000	0.000					-	-	-	-
			NDC	24	2	5.500	5.500	1.500	1.500	4.000	4.000	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	13		0.000	0.000	-	-	-	-	-	-	-	-
Mexico	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	69		0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	211		0.000	0.000	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	251	11	0.632	0.632	0.001	0.001	-	-	0.630	0.630	-	-
			NDC	47		0.000	0.000	-	-	-	-			-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Micronesia (Federated States of)	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	23		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	12		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Mongolia	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	7	7	3.519	3.789	3.519	3.789	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	62		0.000	0.000	-		-	-	-	-	-	-
			NDC	14	14	11.500	11.500	6.300	6.300	5.200	5.200	-	-	-	-
			TAP	51	30	1.663	1.663	1.663	1.663			-	-	-	-
			TNA	132	129	0.849	0.849	-	-	0.849	0.849	-	-	-	-
Montenegro	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	11		0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	119	26	4.799	4.799	4.786	4.786	0.013	0.013	-	-	-	-
			NDC	19	16	2.079	2.079	2.079	2.079	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Morocco	African States		AC	13	-	0.000	0.000	-	-	-	-	-	-	-	-
			BUR	105	86	39.125	39.125	39.125	39.125	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	80	74	0.390	0.666	0.319	0.586	0.002	0.010	0.070	0.070	-	-
			NDC	99	68	90.515	90.515	49.672	49.672	40.843	40.843	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	58	5	0.461	0.461	0.450	0.450	0.011	0.011			-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Mozambique	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	8	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	35	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	59	59	11.561	11.561	11.323	11.323	0.239	0.239	-	-	-	-
			TNA	45	5	0.014	0.095	-	-	0.014	0.095	-	-	-	-
Myanmar	Asia-Pacific States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	61	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	75	14	0.021	0.021	0.021	0.021	-	-	-	-	-	-
			NDC	7	-	0.000	0.000			-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Namibia	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	50	10	1.771	1.771	1.771	1.771	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	48	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	32	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	25	-	0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Nauru	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	110	109	0.056	0.056	0.056	0.056	-	-	-	-	-	-
			NDC	3	2	0.050	0.050	0.050	0.050	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Nepal	Asia-Pacific States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	9	9	0.350	0.350	-	-	0.350	0.350	-	-	-	-
			NC	94	60	0.745	0.745	0.000	0.000	0.745	0.745	-	-	-	-
			NDC	81	53	25.000	25.000	25.000	25.000	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Nicaragua	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	18	4	1.680	1.680	-	-	1.680	1.680			-	-
			NDC	28	3	1.650	1.650	-	-	1.650	1.650			-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Niger	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	14		0.000	0.000	-	-	-	-	-	-	-	-
			NC	85	4	0.020	0.020	0.020	0.020			-	-		
			NDC	23	23	8.689	8.689	7.060	7.060	1.611	1.611	-	-	0.018	0.018
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Nigeria	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	21		0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	43		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	21		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Niuea[a]	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	22		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	10	4	0.010	0.010	0.010	0.010	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	7		0.000	0.000			-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
North Macedonia	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	20	8	26.279	26.279	26.279	26.279	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	40	11	7.241	7.241	7.241	7.241	-	-	-	-	-	-
			NDC	13		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	16		0.000	0.000	-	-	-	-	-	-	-	-
Oman	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	9	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	13	-	0.000	0.000	-	-			-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Pakistan	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	37	1	70.000	140.000	0.000	0.000	70.000	140.000	-	-	-	-
			NDC	11	11	110.000	180.000	40.000	40.000	70.000	140.000	-	-	-	-
			TAP	66	62	0.318	0.318	0.057	0.057	0.261	0.261	-	-	-	-
			TNA	105		0.000	0.000					-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Palau	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	17	8	0.256	0.256	0.098	0.098	0.158	0.158	-	-	-	-
			NDC	1	1	0.006	0.006	0.006	0.006			-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Panama	Latin American and Caribbean States		AC	11		0.000	0.000					-	-	-	-
			BUR	52		0.000	0.000					-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	90		0.000	0.000					-	-	-	-
			NDC	32	1	0.081	0.081	0.081	0.081			-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	10	3	0.039	0.039	0.001	0.001	0.039	0.039	-	-	-	-
Papua New Guinea	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	15	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	142	41	1.646	1.646	0.294	0.294	1.329	1.329	-	-	0.023	0.023
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Paraguay	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	47	-	0.000	0.000	-				-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	60		0.000	0.000	-				-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	40	1	0.001	0.001	-	-			0.001	0.001	-	-
			NDC	2		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	5	1	0.003	0.003	0.003	0.003					-	-
Peru	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	79	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	18	9	1.245	1.245	0.755	0.755	0.306	0.306	0.184	0.184	-	-
			NDC	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	13	12	0.015	0.015	0.008	0.008	0.007	0.007			-	-
Philippines	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	45	2	2.960	2.960	2.960	2.960	-	-	-	-	-	-
			NDC	2		0.000	0.000			-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	21	2	2.200	2.200	2.200	2.200	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Qatar	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	5	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	10	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Korea	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	92	4	42.808	42.808	42.808	42.808	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	-	-	-	-	-	-	-	-	-	-	-	-
			NDC	26	1	17.270	17.270	17.270	17.270	-	-			-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Moldova	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	65	26	4.882	4.882	4.882	4.882	-	-	0.000	0.000	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	5	5	4.664	4.664	4.664	4.664	-	-	-	-	-	-
			NDC	211	96	7.278	7.278	0.034	0.034	4.379	4.379	-	-	2.864	2.864
			TAP	187	28	1.863	1.863	1.863	1.863			-	-	-	-
			TNA	11	5	0.060	0.060			0.060	0.060	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Rwanda	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	25		0.000	0.000					-	-	-	-
			NC	22		0.000	0.000					-	-	-	-
			NDC	54	54	10.634	10.634	5.270	5.270	5.363	5.363	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	20		0.000	0.000	-	-	-	-	-	-	-	-
Saint Kitts and Nevis	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	37		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	39		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	43		0.000	0.000	-	-	-	-	-	-	-	-
Saint Lucia	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	17		0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	119	39	0.941	0.941	0.252	0.252	0.661	0.661	0.028	0.028	-	-
			NDC	15	4	0.368	0.368	0.368	0.368	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	61		0.000	0.000	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Saint Vincent and Grenadines	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	27	10	0.007	0.007	-	-	0.007	0.007			-	
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NDC	9		0.000	0.000	-	-						
			NC	19		0.000	0.000	-	-						
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Samoa	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	33	33	1.549	1.549	-	-	1.549	1.549	-	-		
			NC	47	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	5	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
San Marino	Western European and other States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	17	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	1	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Sao Tome and Principe	African States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	22	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	33	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	15	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	31	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	86	-	0.000	0.000	-	-			-	-	-	-
			NDC	24	-	0.000	0.000	-	-			-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Senegal	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	50	7	0.513	0.513	-	-	0.513	0.513	-	-	-	-
			NC	37		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	32	32	13.081	13.081	8.763	8.763	4.318	4.318	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	62	15	0.665	0.665			0.665	0.665	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Serbia	Eastern European States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	32	32	9.545	9.638	9.545	9.638	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	44	32	10.068	10.068	10.068	10.068	-	-	-	-	-	-
			NDC	3		0.000	0.000			-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Seychelles	African States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	9	-	0.000	0.000			-	-	-	-	-	-
			NDC	39	11	0.604	0.604	0.309	0.309	0.295	0.295	-	-	-	-
			TAP	51	2	0.008	0.008	0.008	0.008			-	-	-	-
			TNA	12	-	0.000	0.000					-	-	-	-
Sierra Leone	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	17	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	74	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	21	1	0.900	0.900	0.900	0.900	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Singapore	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	9	2	0.087	0.087	0.086	0.086	0.001	0.001	-	-	-	-
			LEDS	41	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	4		0.000	0.000					-	-	-	-
			NDC	10		0.000	0.000					-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Solomon Islands	Asia-Pacific States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	7	7	0.017	0.017	-	-	0.017	0.017	-	-	-	-
			NC	107		0.000	0.000					-	-	-	-
			NDC	15	15	11.345	11.345	11.110	11.110	0.235	0.235	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Somalia	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	15		0.000	0.000					-	-	-	-
			NC	2		0.000	0.000					-	-	-	-
			NDC	8	5	0.079	0.079	0.028	0.028	0.044	0.044	0.006	0.006	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
South Africa	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	12		0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	7	7	1650.000	1650.000	1350.000	1350.000	300.000	300.000	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	26	5	0.034	0.034	0.034	0.034			-	-	-	-
			NDC	19	12	1478.850	1479.850	1380.450	1380.450	98.400	99.400	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	25		0.000	0.000					-	-	-	-
South Sudan	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	33	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	46	46	50.000	50.000	50.000	50.000	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Sri Lanka	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	609	279	0.830	0.830	-	-	0.830	0.830	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	22	1	0.427	0.427	-	-	0.427	0.427	-	-	-	-
			NDC	215		0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	9	6	9.644	9.644	9.644	9.644	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
State of Palestinea[a]	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	83	83	3.663	3.663			3.663	3.663	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	160	143	3.546	3.546			3.546	3.546	-	-	-	-
			NDC	108	82	14.130	14.130	10.600	10.600	3.530	3.530	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Sudan	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	14	1	0.300	0.300	-	-	0.300	0.300	-	-	-	-
			NAPA	14		0.000	0.000	-	-	-	-	-	-	-	-
			NC	12		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	15	12	14.393	14.393	4.393	4.393	10.000	10.000	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	11	9	25.214	25.214	-	-	25.214	25.214	-	-	-	-
Suriname	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	9		0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	31		0.000	0.000	-	-	-	-	-	-	-	-
			NDC	31	19	1.842	1.842	1.842	1.842	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Syrian Arab Republic	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	-	-	-	-	-	-	-	-	-	-	-	-
			NDC	43	-	0.000	0.000	-	-	-	-	-		-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Tajikistan	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	14	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	7	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	9	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	60	-	0.000	0.000	-	-	-	-	-	-	-	-
Thailand	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	58	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	52	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	35	-	0.000	0.000	-	-	-	-	-	-		
			TAP	62	6	0.045	0.045	0.033	0.033	-	-	-	-	0.011	0.011
			TNA	29	6	3.001	3.001	2.990	2.990	0.011	0.011	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Timor Leste	Asia-Pacific States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	18	-	0.000	0.000	-	-	-	-	-	-	-	-
			NAPA	34	10	0.091	0.091	-	-	0.091	0.091	-	-	-	-
			NC	30	3	0.229	0.229	0.031	0.031	0.070	0.070	0.129	0.129	-	-
			NDC	21	2	0.002	0.002	0.002	0.002	0.000	0.000	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Togo	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	57	56	6.391	6.391	5.434	5.434	0.957	0.957	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	19	19	0.956	0.956	-	-	0.956	0.956	-	-	-	-
			NAPA	17	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	35	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	14	14	2.640	2.640	1.100	1.100	1.540	1.540	-	-	-	-
			TAP	254	-	0.000	0.000	-	-	-	-	-	-	-	-
			TNA	28	-	0.000	0.000	-	-	-	-	-	-	-	-
Tonga	Asia-Pacific States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	230	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	6	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Trinidad and Tobago	Latin American and Caribbean States	SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	14	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	1	1	2.000	2.000	2.000	2.000	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Tunisia	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	17	15	2.642	2.642	2.642	2.642	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	3	2	13.353	13.353	13.000	13.000	0.353	0.353	-	-	-	-
			NDC	13	13	19.924	19.924	17.945	17.945	1.979	1.979	-	-	-	-
			TAP	163	163	0.109	0.109	0.066	0.066	0.043	0.043	-	-	-	-
			TNA	38	19	9.439	9.439	-	-	9.439	9.439	-	-	-	-
Turkmenistan	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	94	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	3	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Tuvalu	Asia-Pacific States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	9	10	0.008	0.008	-	-	0.008	0.008	-	-	-	-
			NC	40	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	5	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Uganda	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	11	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	7	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	67	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	53	53	8.200	8.200	5.800	5.800	2.400	2.400	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	36	3	0.199	0.199	0.199	0.199	-	-	-	-	-	-
United Arab Emirates	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	2	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	2	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
United Republic of Tanzania	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	17	7	0.080	0.080	-	-	0.080	0.080	-	-	-	-
			NC	81	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	54	54	65.000	65.000	60.000	60.000	5.000	5.000	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	18	-	0.000	0.000			-	-	-	-	-	-
Uruguay	Latin American and Caribbean States		AC	39	-	0.000	0.000	-	-	-	-	-	-	-	-
			BUR	80	24	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	75	3	0.003	0.003	-	-	0.003	0.003	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	9	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	32	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	6	6	0.013	0.013	-	-	0.013	0.013	-	-	-	-
			TNA	21	5	0.093	0.093	0.092	0.092	-	-	0.002	0.002	-	-
Uzbekistan	Latin American and Caribbean State		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	202	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	40	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Vanuatu	Asia-Pacific States	LDC&SIDS	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	31	-	0.000	0.000	-	-	-	-	-	-	-	-
			NC	33	33	1.299	1.299	0.180	0.180	0.009	0.009	1.110	1.110	-	-
			NDC	31	29	0.174	0.174	0.174	0.174	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela (Bolivarian Republic of)	Latin American and Caribbean States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	14	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	45	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Viet Nam	Asia-Pacific States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	21	5	44.130	44.130	44.130	44.130	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	14	8	37.836	47.393	2.836	12.393	35.000	35.000	-	-	-	-
			NDC	36	20	35.000	35.000	-	-	35.000	35.000	-	-	-	-
			TAP	160	159	0.340	0.340	0.057	0.057	0.283	0.283	-	-	-	-
			TNA	35	2	0.204	0.204	-		0.204	0.204	-	-	-	-

Country	Region	LDCs/SIDS	Report types	Total Number of needs	Total Number of quantified needs	Expressed amount as needs (USD Billion)									
						Total (Low range)	Total (High range)	Mitigation (Low range)	Mitigation (High range)	Adaptation (Low range)	Adaptation (High range)	Cross-cutting (Low range)	Cross-cutting (High range)	Other (Low range)	Other (High range)
Yemen	Asia-Pacific States	LDC	AC	-	-			-	-	-	-	-	-	-	-
			BUR	8	-	0.000	0.000	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	23	4	0.030	0.030	-	-	0.030	0.030	-	-	-	-
			NC	24	-	0.000	0.000	-	-			-	-	-	-
			NDC	34	8	1.201	1.201	-	-	1.201	1.201	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	-	-	-	-	-	-	-	-	-	-	-	-
Zambia	African States	LDC	AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	16	1	50.000	50.000	0.000	0.000	-	-	50.000	50.000	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	20	12	0.030	0.030	-	-	0.030	0.030	-	-	-	-
			NC	98	83	25.196	25.196	24.891	24.891	0.301	0.301	0.003	0.003	-	-
			NDC	24	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	12	-	0.000	0.000	-	-	-	-	-	-	-	-
			TNA	12	5	1.680	1.680	-	-	1.680	1.680	-	-	-	-
Zimbabwe	African States		AC	-	-	-	-	-	-	-	-	-	-	-	-
			BUR	-	-	-	-	-	-	-	-	-	-	-	-
			LEDS	-	-	-	-	-	-	-	-	-	-	-	-
			NAP	-	-	-	-	-	-	-	-	-	-	-	-
			NAPA	-	-	-	-	-	-	-	-	-	-	-	-
			NC	27	-	0.000	0.000	-	-	-	-	-	-	-	-
			NDC	33	-	0.000	0.000	-	-	-	-	-	-	-	-
			TAP	-	-	-	-	-	-	-	-	-	-	-	-
			TNA	13	-	0.000	0.000	-	-	-	-	-	-	-	-
Grand total				21,925	6,468	28,154.374	28,319.197	13,921.739	13,940.908	8,770.923	8,912.018	5,445.641	5,445.641	16.070	20.630

[a] For the purposes of this report they are geographically included in the Asian-Pacific states and are Non-Annex I Parties, however not member states of the United Nations.

Annex D. National reports analysed in the first report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement and their respective guidelines

Report	Description	Mandate	General guidance available	Detailed guidance (methodologies, methods, approaches) available
ACs Adaptation Communications	Adaptation communications present information on adaptation priorities, implementation and support needs, plans and actions, although presentation of detailed information on financial needs is not required. In some cases, adaptation communications are presented independently or in conjunction with other communication and reporting documents, such as NDCs, NAPs and others that also include financial information.	According to Article 7, paragraphs 10 and 11, of the Paris Agreement, each Party should submit and update periodically an adaptation communication, which may include information on its priorities, implementation and support needs, plans and actions.	Yes	No
BURs – Biennial Update Reports	These reports are submitted by non-Annex I Parties every two years, and contain updates of national GHG inventories; including a national inventory report, information on mitigation actions, needs and support received; .and information on "constraints and gaps, and related financial, technical and capacity needs, including a description of support needed".	COP 17 adopted the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention", as contained in annex III to decision 2/CP.17, paragraphs 14–16.	Yes	No
NDCs – Nationally Determined Contributions	These reports embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive NDCs that it intends to achieve.	There are various types of targets in NDCs submitted by Parties, and they include conditional and/or unconditional components. Most of the conditional components are implemented subject to the provision of finance, technology or capacity-building support. The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive NDCs that it intends to achieve. Parties shall pursue domestic mitigation measures to achieve the objectives of such contributions.	Yes	No

Report	Description	Mandate	General guidance available	Detailed guidance (methodologies, methods, approaches) available
NAPAs – National Adaptation Programmes of Action	NAPAs provide a process for the LDCs to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change – those needs for which further delay could increase vulnerability or lead to increased costs later.	In implementing Article 4, paragraph 9, of the Convention, COP 7, in 2001, established an LDC work programme that includes NAPAs to support the LDCs in addressing the challenge of climate change given their vulnerability. The annex to decision 28/CP.7 (pages 7-13) contains guidelines for preparing NAPAs.	Yes	Yes
NAPAs – National Adaptation Programmes of Action	NAPAs provide a process for the LDCs to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change – those needs for which further delay could increase vulnerability or lead to increased costs later.	In implementing Article 4, paragraph 9, of the Convention, COP 7, in 2001, established an LDC work programme that includes NAPAs to support the LDCs in addressing the challenge of climate change given their vulnerability. The annex to decision 28/CP.7 (pages 7-13) contains guidelines for preparing NAPAs.	Yes	Yes
NCs – National Communications	These reports are submitted by non-Annex I Parties every four years. The core elements of NCs include relevant information on national circumstances; GHG inventories; vulnerability and adaptation assessment; mitigation assessment; financial resources and transfer of technology; and education, training and public awareness.	The preparation of NCs is mandated by Article 4, paragraph 1, and Article 12, paragraph 1, of the Convention. Guidelines for the preparation of initial NCs from non-Annex I Parties were adopted at COP 2 in 1996. COP 5 in 1999 initiated a review of the guidelines, and with major contributions from the Consultative Group of Experts. COP 8 in 2002 adopted the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention", as contained in the annex to decision 17/CP.8: Revised guidelines for the preparation of NCs (page 10 includes information on finance, technology and capacity-building support).	Yes	Yes
NAPs -National Adaptation Plans	NAPs are prepared by countries to address medium- and long-term adaptation needs, informed by the latest climate science. The two overarching objectives of NAPs are to (1) reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience and (2) integrate adaptation into new and existing policies and programmes, especially development strategies.	The NAP process was established under the Cancun Adaptation Framework (CAF). It enables Parties to formulate and implement NAPs to identify medium- and long-term adaptation needs. COP 17 adopted the initial guidelines for the formulation of NAPs by the LDCs, and they are contained in the annex to decision 5/CP.17. COP 17 requested the LDC Expert Group (LEG) to elaborate technical guidelines for the NAP process on the basis of the initial guidelines for the formulation of NAPs and arrange a review of these technical guidelines (decision 5/CP.17, paras. 15–16).	Yes	Yes

Report	Description	Mandate	General guidance available	Detailed guidance (methodologies, methods, approaches) available
TNAs – Technology Needs Assessments	The TNA process helps determine a country's climate technology priorities. These are derived from ongoing policies, programmes and projects, long-term vision documents, and strategies for climate change mitigation and adaptation already in place. The TNA process maps out a country's long-term development priorities and also identifies technologies to realize these with lower emissions and stronger climate resilience.	TNAs are a long-standing process. The TNA concept was formalized in 2001, when COP 7, in decision 4/CP.7, established the technology transfer framework. One of the originating themes of the framework is the TNA. Technical guidelines are available, such as the Handbook for conducting Technology Needs Assessments.	Yes	Yes
TAP – Technology Action Plan (Adaptation/ Mitigation)	A TAP is a concise plan for the uptake and diffusion (transfer) of prioritized technologies that will contribute to the country's social, environmental and economic development and to climate change mitigation and adaptation. A TAP is usually made up of numerous specific actions. Often, the TAP is technology-specific, but it can also cover a portfolio of technologies where the same set of actions benefits all technologies.	One of the key outputs from the TNA is a technology action plan (TAP) –a concise plan for the uptake and diffusion of prioritized technologies that will contribute to a country's efforts to reduce GHGs and adapt to climate change. To support countries to develop TAPs that achieve implementation, the Technology Executive Committee has worked with UNEP DTU and the secretariat to develop guidance for preparing TAPs.	Yes	Yes
LEDS – Long-term Low-Emission Development Strategies		Under Article 4, paragraph 19, of the Paris Agreement, all Parties should strive to formulate and communicate long-term low GHG emission development strategies, mindful of Article 2, taking into account their common but differentiated responsibilities and respective capabilities in the light of different national circumstances. The COP, by its decision 1/CP.21, paragraph 35, invited Parties to communicate, by 2020, to the secretariat mid-century, long-term low GHG emission development strategies in accordance with Article 4, paragraph 19, of the Agreement.	Yes	No

Annex E. Methodologies identified in national reports

Mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Deviation from the 'business as usual' scenario	The Cancun Agreements proposed developing countries would carry out emissions reduction (mitigation) under the sustainable development framework and deviate from the '*business as usual*' scenario. Regarding adaptation, alternative scenarios to "business as usual' might influence key drivers of climate change effects; these deviations could change 'business as usual' projections.	The AR4 of the IPCC states that a "significant" range of deviation from the baseline, in the case of adaptation, would indicate the need for the use of low-carbon strategies. Nonetheless, deviation depends on baseline assumptions of developing countries, global emission gaps and assumed allocation schemes, both of which are considered observations to the method because of the level of uncertainty.	Teng Fei, Xu Shuang-Qing (2021). Definition of Business as Usual and Its Impacts on Assessment of Mitigation Efforts. *Advances in Climate Change Research*, Vol. 3(4), pp. 212-219. https://doi.org/10.3724/SP.J.1248.2012.00212 https://www.sciencedirect.com/science/article/pii/S1674927812500456 Upali A. Amarasinghe, Tushaar Shah, Hugh Turral, B. K. Anand (2007). India's water future to 2025-2050: Business as usual scenario and deviations. Colombo, Sri Lanka: International Water Management Institute. 47p. (IWMI Research Report 123) https://www.iwmi.cgiar.org/Publications/IWMI_Research_Reports/PDF/PUB123/RR123.pdf
GHG guidelines	According to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, national inventories contain estimates for the calendar year during which the emissions to or removals from the atmosphere occur. They include GHG emissions and removals taking place at a national level and offshore areas under the country's jurisdiction. Reports include standard reporting tables covering categories, sectors and years.	According to the 2006 IPCC Guidelines, some considerations are applied to inventory quality, for instance disclosure or transparency, completeness for all relevant categories, consistency, comparability with other inventories and accuracy (determined by developing uncertainty assessments).	Kristin Rypdal, Newtion Paciornik, Simon Eggleston, Justin Goodwin, William Irving, Jim Penman, Mike Woodfield (2006). Chapter 1: Introduction to the 2006 Guidelines. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Vol.1: General Guidance and Reporting, pp. 1.1-1.12 https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_1_Ch1_Introduction.pdf
Mitigation integrated assessment models	On the basis of cost-effectiveness of measures, the IPCC has recommended the use of integrated assessment models that combine mitigation measures to reduce energy use, reduce GHG intensity of end-use sectors, decarbonize energy supply, reduce net emissions and enhance carbon sinks in land-based sectors.	According to the AR5 of the IPCC, it is assumed that mitigation integrated assessment models (mitigation measures) are well-designed, cross-sectoral and intersect with other societal goals (i.e. taxation, incentives, regulation and tradable permits). However, it is important to consider distributional effects and institutional feasibility.	Climate Change 2014 Synthesis Report. Summary for Policymakers. In: IPCC (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp. https://archive.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf

Mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
GHG Protocol	The most common approach for calculating GHG emissions is the application of documented emission factors, relating GHG emissions to a proxy measure of activity at an emissions source. The Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories refer to a hierarchy of calculation approaches. http://pdf.wri.org/ghg_protocol_2004_chp006.pdf Other tools developed by the GHG Protocol, are available for calculating the emissions of industries, cities and countries.	Emissions are estimated only after the activity data required have undergone quality control.	Chapter 6: Identifying and Calculating GHG Emissions. In: World Resources Institute and World Business Council for Sustainable Development (2004). The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standard. Available at: https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf Greenhouse Gas Protocol (2021). Calculation Tools. Retrieved from: https://ghgprotocol.org/calculation-tools#country_specific_tools_id
CDM approved methodologies	CDM projects require application baselines and monitoring methodologies in order to determine the amount of certified emission reductions (CERs) they generate. The CDM Executive Board has approved and classified into the following five categories methodologies for: • large-scale CDM project activities • small-scale CDM project activities • large-scale afforestation and reforestation (A/R) CDM project activities • small-scale A/R CDM project activities • carbon capture and storage (CCS) project activities. https://cdm.unfccc.int/methodologies/documentation/2003/CDM-Methodology-Booklet_fullversion.pdf	A suitable methodology for the mitigation activity type and applied technology type or measure is found. The approved methodology is allocated to start the CDM project cycle.	United Nations Framework Convention on Climate Change (2019). *Clean Development Mechanism Methodology Booklet*. Bonn, Germany: UNFCCC, 11th edition, pp. 1-277. https://cdm.unfccc.int/methodologies/documentation/2003/CDM-Methodology-Booklet_fullversion.pdf
Domestic MRV system	The secretariat has developed a measurement, reporting and verification MRV framework for developing country Parties wherein domestic MRV systems are general, voluntary, pragmatic, non-prescriptive, non-intrusive and country driven guidelines to measure supported NAMAs. https://unfccc.int/sites/default/files/unfcccnon-annex_i_mrv_framework.pdf	Domestically supported NAMAs are verified. Needs for technical assistance, capacity-building and financial support are met. Progress is tracked by regular GHG inventory and information updates.	Aryanie Amellina (2017). MRV System in Climate Change. From Kyoto to Paris. *Institute for Global Environmental Strategies (IGES).* Retrieved from: https://www.iges.or.jp/en/publication_documents/pub/presentation/en/6438/02_MRV+System+in+Climate+Change+Context_Amellina_rev.pdf United Nations Climate Change Secretariat (unknown). MRV Framework for Non-Annex I Parties under the UNFCCC. Available at: https://unfccc.int/sites/default/files/unfcccnon-annex_i_mrv_framework.pdf

Mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
MRV system for mitigation actions at the local level	The Measuring, Reporting and Verification (MRV) approach at the local level (1) tracks the impacts and benefits of local climate action on the economy, environment and society, either affirming the pathway is correct or indicating its need for correction;(2) increases the transparency of local action by recording and reporting activities and performance of GHG inventories; (3) increases the credibility of local action by following the latest standards for accounting and reporting ; (4) identifies good practices through which successes are achieved; and (5) creates an enabling environment where policies contribute to coherence and effectiveness of a climate action plan. https://e-lib.iclei.org/wp-content/uploads/2016/05/GCC_Handbook_final-web1.pdf	MRV systems for cities or the local level support cities in achieving the climate action targets. GHG inventories and surveys are carried out. https://www.iges.or.jp/en/publication_documents/pub/presentation/en/6438/02_MRV+System+in+Climate+Change+Context_Amellina_rev.pdf	Aryanie Amellina (2017). MRV System in Climate Change. From Kyoto to Paris. *Institute for Global Environmental Strategies (IGES)*. Retrieved from: https://www.iges.or.jp/en/publication_documents/pub/presentation/en/6438/02_MRV+System+in+Climate+Change+Context_Amellina_rev.pdf Marques, Anne, Chang Deng-Beck, Maryke van Staden, Joseph Wladkowski, Agathe Cavicchioli, Lucy Price, Steve Gawler, Soumya Chaturvedula, Igor AlbuTuerTue, Steven Bland, Stephen Davis (2016): *From strategy to delivery. Measuring, Reporting, Verification (MRV) of Urban Low Emission Development. ICLEI's GreenClimateCities Handbook for Local Governments. Report ICLEI Local Governments for Sustainability.* Available at: https://e-lib.iclei.org/wp-content/uploads/2016/05/GCC_Handbook_final-web1.pdf.
Key category analysis	Key category analysis is used to identify categories that have significant influence on a country's GHG inventory. These categories should be prioritized during data collection, inventory compilation, quality assurance and reporting.	Categories that contribute at least 95 per cent of national emissions in the current GHG inventory are identified, and ranked tier1 and tier2 for uncertainty analysis.	Kristin Rypdal et al. (2006). Chapter 1: Introduction to the 2006 Guidelines. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Vol. 1: General Guidance and Reporting, pp. 1.1-1.12 https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_1_Ch1_Introduction.pdf Revet, Dominique (2016): *The Key Category Analysis. Africa Regional Workshop on the Building of Sustainable National Greenhouse Gas Inventory Management Systems, and the Use of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.* UNFCCC. Available at: https://unfccc.int/sites/default/files/5_-_key_category_analysis_rev2.pptx.pdf

Mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
IPCC tier 1 methodology	A 'tier' represents a level of methodological complexity. The IPCC has classified its methodological approach into three tiers according to the detail of information required and the degree of analytical complexity (IPCC 2003 and 2006 Guidelines). Tier 1 is the basic method that employs the gain–loss method and default emission factors among other parameters, provided in the annexes to the IPCC guidelines *Good Practice Guidance for Land Use, Land-Use Change and Forestry and 2006 IPCC Guidelines for National Greenhouse Gas Inventories.*	When using the tier 1 methodology, simplified assumptions about some carbon pools may be combined with spatially explicit activity data derived from remote sensing.	Global Forest Observation Initiative (2013). *The IPCC Tier Concept. In: Integrating remote-sensing and ground-based observations for estimation of emissions and removals of greenhouse gases in forests: Methods and Guidance from the Global Forest Observations Initiative.* Geneva, Switzerland: Group on Earth Observations. Available at: https://redd.unfccc.int/uploads/2_77_redd_20140218_mgd_report_gfoi.pdf Rypdal, Kristin, Newtion Paciornik, Simon Eggleston, Justin Goodwin, William Irving, Jim Penman, Mike Woodfield (2006). *Chapter 1. Introduction to the 2006 Guidelines. 2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Vol.1: General Guidance and Reporting, pp. 1.1-1.12. Available at: https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_1_Ch1_Introduction.pdf
LEAP model	LEAP is a Microsoft Windows-based tool for energy planning and GHG mitigation assessment developed by the Stockholm Environment Institute (SEI). It uses scenario-based modelling to explore how emissions may change in the future under different policy settings. While it is typically applied to nations, it can be used for cities and regions.	LEAP supports not only modelling, but also data management and documentation, results visualization and stakeholder communication. It assumes a low initial data requirement and is a bottom-up approach.	Heaps, Charlie (unknown). *Using LEAP for GHG Mitigation Assessment*. Stockholm Environment Institute. Available at: https://unfccc.int/sites/default/files/resource/LEAP%20UNFCCC%20Nov%202018.pdf.
Future climate scenarios	Since 1990, the IPCC has developed long-term emissions scenarios for analysing climate change impacts and exploring options for mitigation. "Scenarios are alternative images of how the future might unfold and are an appropriate tool with which to analyse how driving forces may influence future emission outcomes and to assess the associated uncertainties" (IPCC WGIII, 2018). Forty scenarios were developed for the Special Report on Emissions Scenarios, divided into four storylines which are recommended to be used in combination.	Emission pathways are highly uncertain. Scenarios are based on driving forces and emissions: demographic change, social and economic development and the rate and direction of technological change.	Intergovernmental Panel on Climate Change (2000). IPCC Special Report Emissions Scenarios. Summary for Policymakers. Special Report of IPCC Working Group III, pp. 1-27. Retrieved from: https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf

Mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Nationally Appropriate Mitigation Actions (NAMA)	NAMAs are voluntary actions taken by developing countries to reduce GHG emissions. They are interpreted as support for sustainable development, are submitted by sector and are often project-based. Different approaches are used depending on whether the NAMA is related to a policy or a project.	NAMAs should align with national long-term development planning and priorities for emission reduction. NAMAs might be based on TNAs, LEDs or MRV systems.	Lütken, Søren E, Bjoern Dransfeld, Stefan Wehner (2013). *Guidance for NAMA Design. Building on Country Experiences. UNFCCC, UNEP and UNDP Report, pp.1-104*. Available at: https://unfccc.int/files/cooperation_support/nama/application/pdf/guidance_for_nama_design_(2013)_final.pdf
Government Climate Action Tracker (CAT)	CAT rates a government's commitment under the Paris Agreement based on the submitted NDC.	Government climate commitments for the Paris Agreement should be adequate and fair. Six rating categories are used: Paris Agreement compatible, 2 °C compatible, insufficient, highly insufficient and critically insufficient.	New Climate Institute (2017). *Climate Action Tracker launches new rating system*. Available at: https://newclimate.org/2017/09/19/climate-action-tracker-launches-new-rating-system/
Warsaw Framework for REDD+	The Warsaw Framework for REDD+ was established under the Convention to guide activities in the forest sector in developing countries so as to reduce emissions from deforestation, reduce emissions from forest degradation, conserve forest stocks, sustainably manage forests and enhance forest carbon stocks.	National strategies, capacity-building, implementation and reporting under the Convention are in place. The framework will be monitored and demonstrate results-based finance.	UNFCCC (2021). Warsaw Framework for REDD+. Available at: https://unfccc.int/topics/land-use/workstreams/redd/what-is-redd
Climate Justice Index	The Climate Justice Index serves to quantify the participation of countries in the CO2 budget to ensure fair distribution from a climate justice perspective. For this purpose, data on the ecological footprint, historical responsibility, development capacity, technological capacity, and population of the countries are used.	Ecological footprint is calculated with Ecological Footprint Global Index used by UNEP and the secretariat of the Convention on Biological Diversity, developed by the Global Footprint Network. Historical responsibility is calculated on the basis of on CO2 emissions since 1750, distributed according to IPCC data for 2010. Development capacity is calculated using (1) GDP (World Bank data); (2) percentage of the population living on less than USD 1,25 (i.e. in poverty) (United Nations Statistical Division data); and (3) the Human Development Index (HDI) developed by UNDP. Technological capability is considered using the UNIDO Performance Index of Industrial Competition and R&D expenditure as a percentage of GDP (World Bank data).	Furlan, Marcelo and Mariano, Enzo (2021). Guiding the nations through fair low-carbon economy cycles: A climate justice index proposal, *Ecological Indicators*, Vol. 125, pp. 1-14. https://doi.org/10.1016/j.ecolind.2021.107615

Technology transfer for mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Mechanisms for technology transfer	The IPCC Special Report on Methodological and Technological issues in Technology Transfer mentions technology intermediation as a mechanism for facilitating technology transfer to ensure technological know-how is dispersed and weaknesses are compensated in the system, highlighting the importance of mechanisms in which actions are integrated to make them more effective. Examples of technology transfer mechanisms are: • Technology Cooperation Agreement Pilot Project • National Innovation Systems • Official Development Assistance • GEF • MDBs and • Kyoto Protocol Mechanisms	Technology Transfer is highly influenced by national innovation systems; therefore, it is important to understand the needs, opportunities and constrains of the recipients when undertaking technology transfer. Adaptation of technologies might be needed, and political conditions might need to be met (i.e. bilateral or multilateral arrangements).	K. Madhava Sama and K. Haraguchi (2020). Technology Development and Transfer. Available at: https://www.ipcc.ch/site/assets/uploads/2018/03/ipcc_far_wg_III_chapter_08.pdf https://www.ipcc.ch/site/assets/uploads/2018/03/srtt-en-1.pdf https://archive.ipcc.ch/ipccreports/far/wg_III/ipcc_far_wg_III_chapter_08.pdf UNFCCC (2021). Technology Transfer Framework. More information available at: http://unfccc.int/ttclear/tec/ tech-transfer-framework.html
Technology Needs Assessments TNA	TNAs helps developing countries to determine their climate technology priorities for effective action on climate change. TNA supports national sustainable development, builds national capacity and facilitates the implementation of prioritized climate technologies.	Assessment of technology needs follows a sector-by-sector approach. For each sector under assessment, the analysis comprises the following steps: (1) Overview of options and resources (this step covers an overview of the sector's profile as well as its policy and legislation framework, work already carried out and a stocktake of technologies currently in use.); (2) Selection of key technologies; (3) Identification of barriers and policy needs; (4) Definition and selection of actions; (5) Identification of stakeholders	UNFCCC Climate Technology (2021). Technology Needs Assessment Pathways for Climate Tech Implementation. Available at: https://unfccc.int/ttclear/tna

Finance for mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Marginal Abatement Cost (MAC)	The MAC curve is an abatement cost assessment graph that indicates the marginal cost for varying amounts of emission reduction.	MAC curves are based on individual assessment of abatement measures that are ranked according to their cost from cheapest to most expensive. To generate the cost curve, robust numbers and quality assumptions and methods are needed. Assumptions are highly uncertain and embody a particular world view with lack of full disclosure	Ekins, Paul and Kesicki, Fabian, Smith, Andrew Z.P. (2011): *Marginal* Abatement Cost Curves: A call for caution. *UCL Energy Institute Report*. Available at: http://www.homepages.ucl.ac.uk/~ucft347/MACCCritGPUKFin.pdf
GHG Abatement Cost (GACMO) model	GACMO calculates current and future GHG emissions and the effects of climate actions. The UNEP DTU Partnership developed a GACMO which can be used in preparing NCs, BURs and NDCs. Using this model, countries can calculate the GHG reductions and economic effects of about 100 mitigation actions organized into 24 types of CDM projects.	GACMO is based on the methodologies and emission factors the stablished by the IPCC and framework of the CDM. Assumptions include start year, currency, exchange rate, discount rate, energy prices for the future period, current fuel prices, current electricity price, grid emissions factor, percentage of electricity grid losses, emission factors of the different fossil fuels and main GHG.	UNEP DTU Partnership (2021). The Greenhouse Gas Abatement Cost Model (GACMO). Available at: https://unepdtu.org/publications/the-greenhouse-gas-abatement-cost-model-gacmo/
Cost–benefit Analysis (CBA)	The different approaches to quantitative assessment of adaptation are cost–benefit analysis, cost-effectiveness analysis and risk assessments. Cost–benefit analysis is a quantitative assessment that considers investment opportunities and returns.	CBA assesses efficiency in monetary terms; it quantifies aggregate costs over specific periods of adaptation such as direct costs as investment and internal rates of cost–benefit ratios.	UNFCCC (2011). Assessing the Costs and Benefits of Adaptation Options. An Overview of Approaches. The *Nairobi Work Programme On Impacts, Vulnerability And Adaptation To Climate Change Report*. Available at: https://unfccc.int/resource/docs/publications/pub_nwp_costs_benefits_adaptation.pdf
Economic modelling	An economic model of climate change is a system including parts such as minimizing the cost of achieving an emissions targets, as well as valuing loss of species. This means an integrated sense of knowledge to answer the optimal climate policy question. Economic modelling involves standard parameters focused on considering damages and social welfare. Economic models help to understand and predict conditions of climate change effects under the socioeconomic and environmental umbrellas.	Assumptions of uncertainty, which lead to disagreement, vary according to the economic model.	Dietz, Simon (unknown): Economic models of climate change. *Centre for Climate Change Economics and Policy and the Grantham Research Institute on Climate Change and Environment LSE*. Retrieved from: https://www.cccep.ac.uk/wp-content/uploads/2015/10/symp1_05_Dietz.pdf

Finance for mitigation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Measuring, reporting and verifying systems for climate finance	MRV systems track national, international and private finance flows to identify finance available and further finance needs.		Possible source: UNFCCC (2014). Handbook on Measurement, Reporting and Verification for Developing Country Parties. Available at: https://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/non-annex_i_mrv_handbook.pdf
Climate Public Expenditure and Institutional Review (CPEIR) methodology	CPEIR aims to review public expenditure related to climate change, as well as progress in terms of policies and institutional arrangements, to further identify needs for climate change action.		Possible z: Neil Bird, Thomas Beloe, Merylyn Hedger, Joyce Lee, Kit Nicholson, Mark O'Donnell, Sudha Gooty, Alex Heikens, Paul Steele, Angus Mackay and Mark Miller (2012). Climate Public Expenditure and Institutional Review (CPEIR) Methodological Note. A methodology to review climate policy, institutions and expenditure. *A joint UNDP/ODI working paper*. Available at: https://www.asia-pacific.undp.org/content/rbap/en/home/library/democratic_governance/CPEIR-methodological-note.html Or: https://www.climatefinance-developmenteffectiveness.org/about/what-cpeir
Investment and financial flows analysis	A methodology for conducting global assessments (e.g. OECD, 2008; UNFCC, 2007) and national assessments (e.g. World Bank, 2010; UNFCCC, 2010; UNDP, 2011).		

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
National Adaptation Plan (NAP) Guidelines oach	NAP technical guidelines assist developing countries, particularly the LDCs, in comprehensively addressing adaptation in a coherent and strategic manner when formulating NAPs.	Institutionalized experience in the analysis of risk management (climate and non-climate) at the local and national level, from a proactive and reactive perspective to extreme natural events, including the availability of public policies, methodologies and mechanisms for planned risk management. Main	Possible source: LDC Expert Group (2012). National Adaptation Plans. Technical guidelines for the national adaptation plan process. United Nations Framework Convention on Climate Change (UNFCCC). Available at: https://unfccc.int/files/adaptation/cancun_adaptation_framework/national_adaptation_plans/application/pdf/naptechguidelines_eng_low_res.pdfe

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Vulnerability assessment	Vulnerability is understood as "the propensity or predisposition to be adversely affected... including sensitivity or susceptibility to harm and lack of capacity to cope and adapt" (IPCC WGII AR5, 2014). Various authors from developing countries have developed methods to measure vulnerability, as it is considered by the IPCC.	Assumptions are exposure and sensitivity to potential impacts, as well as adaptive capacity. There are also multiple other stressors to consider in measuring vulnerability, for example, other hazards, weak governments, and globalization (Olsson et al., 2014).	Field, C.B., V.R. Barros, K.J. Mach, M.D. Mastrandrea, M. van Aalst, W.N. Adger, D.J. Arent, J. Barnett, R. Betts, T.E. Bilir, J. Birkmann, J. Carmin, D.D. Chadee, A.J. Challinor, M. Chatterjee,W. Cramer, D.J. Davidson, Y.O. Estrada, J.-P. Gattuso, Y. Hijioka, O. Hoegh-Guldberg, H.Q. Huang, G.E. Insarov, R.N. Jones, R.S. Kovats, P. Romero-Lankao, J.N. Larsen, I.J. Losada, J.A. Marengo, R.F. McLean, L.O. Mearns, R. Mechler, J.F. Morton, I. Niang, T. Oki, J.M. Olwoch, M. Opondo, E.S. Poloczanska, H.-O. Pörtner, M.H. Redsteer, A. Reisinger, A. Revi, D.N. Schmidt, M.R. Shaw, W. Solecki, D.A. Stone, J.M.R. Stone, K.M. Strzepek, A.G. Suarez, P. Tschakert, R. Valentini, S. Vicuña, A. Villamizar, K.E. Vincent, R. Warren, L.L. White, T.J. Wilbanks, P.P. Wong and G.W. Yohe, 2014: Technical summary. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 35-94. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-TS_FINAL.pdf
Community vulnerability and adaptation (CV&A) tool	The CV&A tool is a systemic approach to assessing communities' vulnerability and capacity to adapt to climate change. This tool integrates with the Community Vulnerability Assessment Tool, which supports linking environmental, social and economic data in coastal zones in the Pacific with adaptive interventions.	The CV&A tool assumes climate change is already happening in the Pacific and affecting the livelihood of communities. It also assumes good governance or community cohesion, and an interest in project feasibility.	United Nations Framework Convention on Climate Change (UNFCCC) (2021). Community Vulnerability Assessment Tool (CVAT). Available at: https://www4.unfccc.int/sites/NWPStaging/Pages/item.aspx?ListItemId=22891&ListUrl=/sites/NWPStaging/Lists/MainDB#:~:text=Community%20Vulnerability%20Assessment%20Tool%20(CVAT)%20supports%20the%20linking%20of%20environmental,a%20series%20of%20existing%-20threats.&text=Mitigation%20opportunities%20analysis. https://www.sprep.org/att/publication/000437_CVAGuideE.pdf

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Ecotourism vulnerability assessment	Based on the vulnerability assessment approach. (see above) Ecotourism/tourism vulnerability is analysed as a 'system' in the climate change impacts produced in a specific ecosystem.	Understanding of the ecosystem studied is meaningful, as is the social, environmental and economic context of the area. Constrains and obstacles to climate change adaptation in tourism are not specified. Longitudinal and long-term studies reduce vulnerability.	Field, C.B., V.R. Barros, K.J. Mach, M.D. Mastrandrea, M. van Aalst, W.N. Adger, D.J. Arent, J. Barnett, R. Betts, T.E. Bilir, J. Birkmann, J. Carmin, D.D. Chadee, A.J. Challinor, M. Chatterjee, W. Cramer, D.J. Davidson, Y.O. Estrada, J.-P. Gattuso, Y. Hijioka, O. Hoegh-Guldberg, H.Q. Huang, G.E. Insarov, R.N. Jones, R.S. Kovats, P. Romero-Lankao, J.N. Larsen, I.J. Losada, J.A. Marengo, R.F. McLean, L.O. Mearns, R. Mechler, J.F. Morton, I. Niang, T. Oki, J.M. Olwoch, M. Opondo, E.S. Poloczanska, H.-O. Pörtner, M.H. Redsteer, A. Reisinger, A. Revi, D.N. Schmidt, M.R. Shaw, W. Solecki, D.A. Stone, J.M.R. Stone, K.M. Strzepek, A.G. Suarez, P. Tschakert, R. Valentini, S. Vicuña, A. Villamizar, K.E. Vincent, R.Warren, L.L. White, T.J. Wilbanks, P.P. Wong and G.W. Yohe, 2014: Technical summary. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 35-94. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-TS_FINAL.pdf https://unfccc.int/files/adaptation/methodologies_for/vulnerability_and_adaptation/application/pdf/unfccc_guidelines_-_methods_of_assessing_human_health_vulnerability_and_public_health_adaptation_to_climate_change.pdf

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Human Health vulnerability assessment	Based on the vulnerability assessment approach used by the IPCC. (see above) Human health vulnerability assessments includes a range of health outcomes and evaluates evidence of morbidity and mortality from heat, heatwaves, air pollution floods, windstorms, food insecurity, vector borne-diseases, water- and food-borne diarrheal diseases, and adverse health outcomes associated with stratospheric ozone depletion.	Assumes reliable data are available, including literature review by IPCC and others, and region-specific data.	Field, C.B., V.R. Barros, K.J. Mach, M.D. Mastrandrea, M. van Aalst,W.N. Adger, D.J. Arent, J. Barnett, R. Betts, T.E. Bilir, J. Birkmann, J. Carmin, D.D. Chadee, A.J. Challinor, M. Chatterjee,W. Cramer, D.J. Davidson, Y.O. Estrada, J.-P. Gattuso, Y. Hijioka, O. Hoegh-Guldberg, H.Q. Huang, G.E. Insarov, R.N. Jones, R.S. Kovats, P. Romero-Lankao, J.N. Larsen, I.J. Losada, J.A. Marengo, R.F. McLean, L.O. Mearns, R. Mechler, J.F. Morton, I. Niang, T. Oki, J.M. Olwoch, M. Opondo, E.S. Poloczanska, H.-O. Pörtner, M.H. Redsteer, A. Reisinger, A. Revi, D.N. Schmidt, M.R. Shaw, W. Solecki, D.A. Stone, J.M.R. Stone, K.M. Strzepek, A.G. Suarez, P. Tschakert, R. Valentini, S. Vicuña, A. Villamizar, K.E. Vincent, R.Warren, L.L.White, T.J.Wilbanks, P.P.Wong, and G.W. Yohe, 2014: Technical summary. In: Climate Change 2014: Impacts,Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 35-94. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-TS_FINAL.pdf https://unfccc.int/files/adaptation/methodologies_for/vulnerability_and_adaptation/application/pdf/unfccc_guidelines_-_methods_of_assessing_human_health_vulnerability_and_public_health_adaptation_to_climate_change.pdf
Multi Criteria Analysis (MCA) technique	MCA allows assessment of different adaptation options against a number of criteria. Each option is weighted on the basis of available criteria, and the highest score is selected. The analysis is useful when partial data are available, when cultural and ecological considerations are difficult to quantify and when effectiveness are only two of many criteria.	MCA assumes multiple adaptation objectives and criteria. Each criterion should to be described including its unit and range of scores. Monetized and non-monetized costs and benefits can be considered, but some qualitative scoring and ranking options are subjective and not easily comparable.	United Nations Framework Convention on Climate Change (UNFCCC) (2011). Assessing the costs and benefits of adaptation options: An overview of approaches. Available at: https://unfccc.int/resource/docs/publications/pub_nwp_costs_benefits_adaptation.pdf

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Scenario-driven water-crop modelling framework for agriculture vulnerability assessment	Crop modelling refers to agriculture adaptation studies that use process-based crop models to simulate the impact of weather, climate and management decisions on yield where significant changes in productivity are expected in response to climate change. This modelling framework could also refer to CROPWAT, a decision support system for designing and managing irrigation schemes that can be used for testing the efficiency of different irrigation strategies under climate change scenarios	Data on climatic and crop variables (scenarios) are needed, that is, on reference of evapotranspiration, crop water requirements and crop irrigation requirements.	Beveridge, L., Whitfield, S. and Challinor, A. (2018). Crop modelling: towards locally relevant and climate-informed adaptation. Climatic Change 147, 475–489. Available at: https://link.springer.com/article/10.1007/s10584-018-2160-z https://www.adaptationcommunity.net/?wpfb_dl=236
Second generation or bottom-up approach	Also known as a starting-point approach, this is a vulnerability assessment used in developing countries that starts with an analysis of the people affected by climate change locally. The approach addresses the underlying development context of why people are sensitive and exposed to climate change impacts in the first place. The assessments are participatory in nature and conducted at the local level, and assess current rather than future vulnerability. They involve collecting information from specific locations and the tools usually do not require extensive training to be used.	Not all social groups are equally vulnerable to the negative impacts of climate change. An ability to synthesize results and identify priorities for action is needed. This approach is location-specific, difficult to generalize and very difficult to use for future estimates.	Ministry of Environment, Forests and Climate Change, Government of India (2014). A Framework for Climate Change Vulnerability Assessments. Available at: https://www.adaptationcommunity.net/?wpfb_dl=236
Climate change scenarios	(See the description for future climate scenarios above)	(See the assumptions for future climate scenarios above)	IPCC (2010). IPCC Special report emissions scenarios. Summary for Policymakers. Available at: https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf
Climate change projections	Climate change projections are assessed according to the AR5 of the IPCC on a hierarchy of models: Atmosphere Ocean General Circulation Models, Earth System Models of Intermediate Complexity, and Simple Climate Models. Climate scenarios – from non-mitigation scenarios to idealized long-term scenarios – are currently assessed on the basis of multi-model means.	The assessment of climate change projections in accordance with the AR5 of the IPCC covers mean temperature, temperature extremes, precipitation extremes, droughts, snow and ice, the carbon cycle, ocean acidification, sea level pressure, mean tropical Pacific Ocean climate change, tropical cyclones, mid-latitude storms, Atlantic Ocean meridional overturning circulation, radioactive forcing and climate change commitments.	Meehl, G.A., T.F. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda, S.C.B. Raper, I.G. Watterson, A.J. Weaver and Z.-C. Zhao, 2007: Global Climate Projections. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter10-1.pdf

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Ensemble means for the IPCC atmosphere and ocean models	Using multiple climate models or 'ensembles' is a method known to improve the accuracy and reliability of forecasts. It allows an investigation of the connections between a particular model's errors or biases and characteristics or process parameterizations. In terms of Atmosphere Ocean General Circulation Models of the IPCC, whose primary function is to understand the dynamics of the physical components of the climate system, and which are used for seasonal to decadal climate predictions, the two ensemble means are Coupled Model Intercomparison Project 3 and Coupled Model Intercomparison Project 5.	By sampling modelling uncertainties, ensembles of Atmosphere Ocean General Circulation Models should provide an improved basis for probabilistic projections compared with ensembles of a single model sampling and they cannot span the full range of possible model configurations.	IPCC (2012). Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at: https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-5-4-1.html
Regional climate projections	Chapter 11 of the AR4 of the IPCC considers uncertainty as a measure to assess regional climate projections. AR5 assessments use multi-model ensembles, using perturbed physics ensembles and other approaches. A combination of uncertainties is used to quantify the relative importance of the uncertainty from general circulation models, emissions and downscaling techniques.	Evaluating uncertainty at the regional scale is complicated owing to the smaller signal to internal variability ratio, especially for precipitation. https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter11-1.pdf	Christensen, J.H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C.G. Menéndez, J. Räisänen, A. Rinke, A. Sarr and P. Whetton, 2007: Regional Climate Projections. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter11-1.pdf
The Coordinated Regional Climate Downscaling Experiment CORDEX145 Model	CORDEX is an international collaborative programme providing a model of a regional evaluation framework to improve downscaling techniques and their use in the provision of robust regional climate information for application in vulnerability, impact and adaptation studies.	Assuming a 'domain' or region is covered, they must satisfy the criteria outlined in CORDEX domains. There should be a core set of regional climate models downscaling Global Climate Models over most CORDEX domains, based on available personnel and technical capacities.	https://www.frontiersin.org/articles/10.3389/feart.2019.00294/full https://cordex.org/experiment-guidelines/cordex-core/cordex-core-simulation-framework/ Gutowski Jr., W. J., Giorgi, F., Timbal, B., Frigon, A., Jacob, D., Kang, H.-S., Raghavan, K., Lee, B., Lennard, C., Nikulin, G., O'Rourke, E., Rixen, M., Solman, S., Stephenson, T., and Tangang, F.: WCRP Coordinated Regional Climate Downscaling Experiment (CORDEX): a diagnostic MIP for CMIP6, Geosci. Model Dev., 9, 4087-4095. Available at: https://gmd.copernicus.org/articles/9/4087/2016/

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Assessment of projections using the AR5 of the IPCC set based on the technique of self-organizing maps (SOMs)	SOMs are neural networking algorithms often implemented as tool for 'objective' synoptic weather typing where atmospheric patterns are localized to understand linkages between large-scale regional circulation and local meteorological variables or environmental considerations occurring during extreme events (temperature and rainfall). https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2016JD026256		Liu, Yonggang and Weisberg, Robert H. (2011): *A Review of Self-Organizing Map Applications in Meteorology and Oceanography, Self Organizing Maps - Applications and Novel Algorithm Design.* Dr Josphat Igadwa Mwasiagi (Ed.), ISBN: 978-953-307-546-4, In Tech, Available at: https://www.intechopen.com/books/self-organizing-maps-applications-and-novel-algorithm-design/a-review-of-self-organizing-map-applications-in-meteorology-and-oceanography
Water resources vulnerability assessment	Based on the vulnerability assessment approach (see above). There are various tools for the vulnerability assessment of water resources: • Aquarius, a computer model that determines economic efficiency of water allocation systems. • Interactive River and Aquifer Simulation (IRAS), a simulation tool for evaluating the performance or impacts of alternative designs and operating policies of regional water resource systems • Joint UK Land Environment Simulator (JULES), a process-based model that quantifies vulnerability effects on the land carbon sink and the response of methane emissions from wetlands. • MIKE BASIN, which addresses water allocation • River Basin Simulation Model (RIBASIM), which simulates river basin behaviour under various hydrological conditions. • Soil and Water Assessment Tool (SWAT), which addresses management issues, with a strong focus on modelling water supply. • Water Evaluation and Planning System, an integrated approach to water resource planning	See the assumptions for vulnerability assessment above. In terms of water: • Aquarius associates physical data related to capacity or power with economic data on water demand • The Interactive River and Aquifer Simulation is based on water demand, supply and quality data, and climate scenarios related to pollution changes. • The Joint UK Land Environment Simulator requires weather data. • MIKE BASIN requires a detailed digitalized river system layout, water demand data and withdrawal and reservoir locations. • The River Basin Simulation Model needs data related to component capacities and operating policies, water demand and supply data, economic data and climate scenarios. • The Soil and Water Assessment Tool requires data related to weather, soil properties, topography, vegetation and land management practices. • The Water Evaluation and Planning System requires data on water demand and supply, economic data and climate scenarios. https://www.adaptationcommunity.net/?wpfb_dl=236	Field, C.B., V.R. Barros, K.J. Mach, M.D. Mastrandrea, M. van Aalst, W.N. Adger, D.J. Arent, J. Barnett, R. Betts, T.E. Bilir, J. Birkmann, J. Carmin, D.D. Chadee, A.J. Challinor, M. Chatterjee, W. Cramer, D.J. Davidson, Y.O. Estrada, J.-P. Gattuso, Y. Hijioka, O. Hoegh-Guldberg, H.Q. Huang, G.E. Insarov, R.N. Jones, R.S. Kovats, P. Romero-Lankao, J.N. Larsen, I.J. Losada, J.A. Marengo, R.F. McLean, L.O. Mearns, R. Mechler, J.F. Morton, I. Niang, T. Oki, J.M. Olwoch, M. Opondo, E.S. Poloczanska, H.-O. Pörtner, M.H. Redsteer, A. Reisinger, A. Revi, D.N. Schmidt, M.R. Shaw, W. Solecki, D.A. Stone, J.M.R. Stone, K.M. Strzepek, A.G. Suarez, P. Tschakert, R. Valentini, S. Vicuña, A. Villamizar, K.E. Vincent, R. Warren, L.L. White, T.J. Wilbanks, P.P. Wong, and G.W. Yohe, 2014: Technical summary. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 35-94. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-TS_FINAL.pdf

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Vulnerability assessment using CCSM4 Global Climate Model	CCSM4 is a coupled global climate model for simulating the Earth's climate system. It is composed of five models simulating the atmosphere, land-ice, sea-ice, plus one central coupler component that coordinates the others. CCCSM4 is used in vulnerability assessment to evaluate the impacts of climate change on environmental vulnerability according to climate system projections. See also vulnerability assessment above.	See the assumptions for vulnerability assessment above. CCSM4 is based on climate projections restricted to CCSM4 climate model variables.	Vertenstein, M., Craig, T., Middleton, A., Feddema, D., & Fi Available at: https://www.cesm.ucar.edu/models/ccsm4.0/ccsm_doc/ug.pdf
Agriculture vulnerability assessment	Based on the vulnerability assessment approach (see above). https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-TS_FINAL.pdf With regard to the agriculture sector, the impacts of climate change affect smallholders and subsistence farmers. There are two key drivers of the vulnerability assessment: biophysical and socioeconomic. Methodologies available for the vulnerability and adaptation assessment in the agriculture sector range from sector-wide economic analysis to farm-level crop modelling. Other tools available are specific for particular ecological factors or processes or are used to support broader adaptation decisions.	See the assumptions for vulnerability assessment above. In agriculture, quantitative descriptions of the exposure unit and information on the baseline agricultural system are needed. Also, data are needed for projecting future baselines.	UNFCCC (2008): *Resource Guide for Preparing the National Communications of Non-Annex I Parties, Module 2: Vulnerability and Adaptation to Climate Change*. Available at: https://unfccc.int/resource/docs/publications/08_resource_guide2.pdf
Vulnerability and adaptation assessment	See community vulnerability and adaptation tool above.	See community vulnerability and adaptation tool above.	UNFCCC (2021). Community Vulnerability Assessment Tool (CVAT). Available at: https://www4.unfccc.int/sites/NWPStaging/Pages/item.aspx?ListItemId=22891&ListUrl=/sites/NWPStaging/Lists/MainDB#:~:text=Community%20Vulnerability%20Assessment%20Tool%20(CVAT)%20supports%20the%20linking%20of%20environmental,a%20series%20of%20existing%-20threats.&text=Mitigation%20opportunities%20analysis https://www.sprep.org/att/publication/000437_CVAGuideE.pdf

Adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Global Alliance for Wealth Accounting and the Valuation of Ecosystem Services	This methodology is a World Bank-led global partnership, and part of the Global Program on Sustainability, that aims to promote sustainable development by ensuring that natural resources are mainstreamed in development planning and national economic accounts. Wealth accounting underpins the income generated by a country. This methodology measures produced capital, natural capital, human capital and net foreign assets. There is a standard for measuring national income and savings.	This methodology assumes as wealth not only produced capital, but also human capital and the benefits flowing from ecosystem services such as pollination and flood protection by mangroves. This wealth of ecosystem services should be included in the System of National Accounts.	Wealth Accounting and the Valuation of Ecosystem Services (2021): *Wealth Accounting and WAVES*. Available at: https://www.wavespartnership.org/
Climate Risk Profile (CRP)	CRP is a core scientific tool used for vulnerability and adaptation assessments. It evaluates the likelihood of all relevant climate-related risks on the basis of observed and other pertinent climate data, estimates and future risk changes.	The CRP tool is supplemented by sector-specific data as well as expert judgment.	
Analysis of vulnerability and risk due to climate change	This analysis takes as its basis the main dimensions used in the Notre Dame Global Adaptation Initiative (ND-GAIN) international study, with adjustment for national circumstances. National experts identified six dimensions and defined each of them. The dimensions allowed critical aspects of the climate–society relationship that can impede the well-being of communities to be identified.		
PRECIS regional climate model	This regional climate modelling system allows developing countries to easily produce detailed climate projections for any region of the world, which can assist in characterizing levels of vulnerability.		

Capacity-building adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
NAP model	The model for planning action is based on the Foundation of Policy Principles (discussed in the previous section), which are summarized as: (1) participation, (2) information and reporting, (3) public–private partnerships, (4) technology and innovation, (5) legislation, (6) commitment of resources, (7) science-based decision-making, and (8) minimization of risk and maximization of opportunity. On this foundation, the NAP model has two levels of action. At the first, national level, the strategic components for action are: (1) institutions, (2) capacity and capability, (3) integration/ mainstreaming, (4) data and information, (5) finance and technology, and (6) social equity. The second level of action considers these strategic components by sector on the basis of whether the particular sector is cross-foundational, productive or cross-cutting with respect to climate change.		
Climate change issues awareness	A broad range of Action for Climate Empowerment activities with multi-sectoral, multi-stakeholder and participatory approaches that are carried out at the national, subnational and local level.		

Technology transfer for adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Method Technology Needs Assessments (TNAs) by sector	See TNA above. https://unfccc.int/ttclear/tna Description	The TNA assumes a cost–benefit analysis where each technology is evaluated against a range of criteria related to investment cost, productivity, income-generating potential and the potential to improve equity, respect of cultural rights, policy integration, institutionalization, and other criteria depending on the country's needs.	UNEP DTU Partnership and the Fijian Ministry of Economy (2020), Technology Needs Assessment Report Adaptation. Available at: https:// tech-action.unepdtu.org/wp-content/ uploads/sites/2/2020/05/tna-adaptation-report-fiji.pdf

Technology transfer for adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Multi-Criteria Decision (MCDA) Analysis	MCDA is used to assess technology needs for climate change adaptation. Stakeholder consultations are held to prioritize sectors for climate change adaptation using the following criteria: economic, social and environmental benefits, and application potential, and potential to adapt to climate change. The rating scheme is 0–5 (a higher score means a higher priority). In each sector, technologies are scored and weighted using the criteria above. Multi-criteria decision analysis is then used to analyse the benefit–cost and the average benefit point of each technology. Finally, decisions are made as to which technology should be prioritized.		

Finance for adaptation			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Quantitative assessment of adaptation investment opportunities and returns	See cost–benefit analysis above. CBA analysis assesses efficiency in monetary terms; it quantifies aggregate costs over specific periods of adaptation such as direct costs as investment and internal rates of cost–benefit ratios. https://unfccc.int/resource/docs/publications/pub_nwp_costs_benefits_adaptation.pdf	Assumes inputs and outputs are valued at market prices – this is considered the empirical data and also a welfare economics. Assumptions of causation (cause-effect) impacts identified from the scope and boundaries of the project or investment; quantified and monetized by performing sensitivity analysis scenarios as reference. http://www.fao.org/3/I8905EN/i8905en.pdf	UNDP (2018). Cost-benefit analysis for climate change adaptation policies and investments in the agriculture sectors. Available at: http://www.fao.org/3/I8905EN/i8905en.pdf

Crosscutting			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
TAP methodology and process	TAPs support the implementation of the technologies prioritized by the TNA. TAPs are built upon the measures identified in the TNA for overcoming barriers to technology implementation and they serve as a 'bridge' between the analysis of prioritized technologies and their implementation.	Assumes a set of concrete actions, an indicative investment proposal for each technology, and proposal requirements that are sufficiently detailed and informative for pre-assessment.	UNFCCC & UNEP DTU Partnership (2016). Enhancing Implementation of Technology Needs Assessments, Guidance for Preparing a Technology Action Plan. Available at: https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_column_M/33933c6ccb7744bc8fd643feb0f8032a/82af010d04f14a84b9d24c5379514053.pdf

Crosscutting			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Socioeconomic analysis of INDC projects	Policy priorities in most countries are jobs, development and social inclusion. By this method, climate policies' impacts on SDGs, GDP, inequality, poverty, etc., are measured so as to maximize the gains and minimize the losses.	Models should ideally include economic, social and environmental dimensions with realistic data for the labour market. Market failures in informal jobs and unemployment are considered, as are climate policies' impacts on inequality and distribution of wealth. This analysis is country- and sector-specific.	Baker-Gallegos, J.& Harsdorff M., The Socioeconomic Impacts of the Nationally Determined Contributions (NDCs), Green Jobs Assessment Institutions Network, International Labour Organization, 19 July 2019, Webinar. https://www.ilo.org/global/topics/green-jobs/areas-of-work/gain/webinars/WCMS_712190/lang--en/index.htm
Prioritization of the major projects recommended for each sector	There are various prioritization exercises according to each country's needs for mitigation and adaptation management. They are based on global context, national priorities, relevant sectors in terms of emissions, and vulnerability according to national inventories.	National GHG inventories and vulnerability statistics in all sectors are taken into account and ranked according to socioeconomic, environmental and, sometimes, political opportunities.	
Rating schemes	A rating scheme or rating system known as CAT Effort Sharing Assessment is used by the Climate Action Tracker to rate NDCs, 2020 pledges, domestic and internationally supported targets, "fair share" targets and consistency withthe Paris Agreement 1.5 °C temperature goal. Rating systems are also used in forest fire danger warning (Canadian Forest Fire Danger Rating System CFFDRS) and sustainable housing to measure resilience.	Assumes all sectors and mitigation/ adaptation efforts (NDCs) are both submitted on time and th	Climate Action Tracker (2021). Countries Rating System. Available at: https://climateactiontracker.org/countries/rating-system/ Climate Action Tracker (2021): *CAT Rating methodology*. Available at: https://climateactiontracker.org/methodology/cat-rating-methodology/ Taylor, S. W., & Alexander, M. E. (2003). Considerations in developing a national forest fire danger rating system. In *XII World Forestry Congress, Quebec, Canada*. Available at: http://www.fao.org/3/XII/0726-B1.htm
Technology prioritization for the agriculture sector	See TNA above. TNAs can be undertaken at different scales and for specific sectors, including the agriculture sector.	See the assumptions for TNA by sector above. https://tech-action.unepdtu.org/wp-content/uploads/sites/2/2013/12/technologyneedsassessmentreport-ghana-13.pdf	UNFCCC (2021g): *Technology Needs Assessment Pathways for Climate Tech Implementation*. Available at: https://unfccc.int/ttclear/tna
INDCs	INDCs outline intended actions to be taken by Parties to achieve the long-term goals agreed to achieve net zero emissions in the second half of the century. INDCs reflect primary means and ambition for emission reduction.	Assume the country's contributions of GHGs according to the inventory and the context of national priorities, circumstances and capabilities.	World Resource Institute (2021). What is an INDC? Available at: https://www.wri.org/indc-definition

Crosscutting			
Methodology/ approach	**Description**	**Main assumptions**	**Source**
Green economy indicators	These indicators are key evidence-based instruments that facilitate the evaluation of green economy policies by (1) identifying priority issues, (2) formulating and assessing green economy policy options, and (3) evaluating the performance of the policy implementation. https://www.unep.org/explore-topics/green-economy/what-we-do/economic-and-trade-policy/metrics-and-measurements#:~:text=Green%20Economy%20Indicators%20are%20key,the%20performance%20of%20policy%20implementation	Green economy indicators are issue driven and may vary from country to country; they are also linked one another.	UNEP. (2015b). Indicators for Green Economy Policymaking – A Synthesis Report of Studies in Ghana, Mauritius and Uruguay. Available at: https://www.greengrowthknowledge.org/sites/default/files/downloads/resource/Indicators_for_Green_Economy_Policy_Making_A_Synthesis_Report_of_Studies_in_Ghana_Mauritius_and_Uruguay_UNEP.pdf

Annex F. Methodologies identified in regional and global reports

Source	Methodology	Main assumptions
Energy investment needs for fulfilling the Paris Agreement and achieving the SDGs (McCollum et al., 2018)	Six global energy–economy and integrated assessment models were used in the study for the analysis of investment needs. These models include least–cost optimization models, computable general equilibrium models, game-theory models and recursive-dynamic simulation models. Such diversity is beneficial for shedding light on those model findings even when there are diverging assumptions and potential outliers deserving of further investigation. Three scenarios were explored. A 'business as usual' scenario served as each model's reference case (or baseline and accounted for those energy- and climate-related policies that were already "on the books" of countries as of 2015. The two other scenarios pursued low-carbon energy, energy efficiency, and climate change mitigation to varying degrees: (1) "nationally determined contributions" based on countries' submissions under the Paris Agreement and (2) "well below 2 degrees", a more ambitious scenario consistent with the decarbonization strategy needed to keep warming well below 2 °C.	Assumptions regarding population and socioeconomic development across all scenarios are in line with the "middle-of-the-road" story line of the shared socioeconomic pathways (SSP 2) developed by the integrated assessment research community and used by the IPCC.
International Energy Agency (IEA) World Energy Outlook	The World Energy Outlook (WEO), which analyses trends in energy demand and supply, is published each year. It uses a scenario-based approach to highlight the key choices, consequences and contingencies that lie ahead, and to illustrate how the course of the energy system might be affected by changing some of the key variables. The Stated Policies Scenario incorporates policies and measures that governments around the world have already put in place, as well as the effects of announced policies, as expressed in official targets and plans. The Sustainable Development Scenario (SDS) starts with the outcomes to be achieved and then assesses what combination of actions would deliver them. Its approach is different from that of the other scenarios, which define the starting conditions and then see where they lead. The outcomes embodied in the Sustainable Development Scenario are derived from the SDGs, providing an energy sector pathway that achieves: universal access to affordable, reliable and modern energy services by 2030 (SDG 7.1); a substantial reduction in air pollution (SDG 3.9); and effective action to combat climate change (SDG 13). The Sustainable Development Scenario is fully aligned with the Paris Agreement and lays out an integrated strategy to achieve climate, air quality and access objectives while also having a strong accent on energy security.	Population growth, GDP growth, fuel prices, carbon prices, electricity prices, investment costs, operating and maintenance costs.
IRENA Global Renewables Outlook Energy Transformation 2050	The study employs a macro econometric model (E3ME model) that links the energy system and the world's economies. It analyses the impact of the energy transition on variables such as GDP, employment and welfare to inform energy system planning and economic policymaking for a just and inclusive energy transition at the global, regional and national level. Several scenarios are presented, including a planned energy scenario based on current government energy plans (incorporating NDC targets) and a transforming energy scenario which describes an ambitious, yet realistic, energy transformation pathway based largely on renewable energy sources and steadily improved energy efficiency (though not limited exclusively to these technologies). This would set the energy system on the path needed to keep the rise in global average temperature to well below 2 °C and towards 1.5 °C during this century.	

Source	Methodology	Main assumptions
IFC climate investment opportunities in emerging markets – analysis, 2016	The first report in a series quantified the potential for low-carbon investment in 21 selected countries where IFC operates. First, the report identified and assessed the targets put forward by the 21 countries in their NDCs and supplemented the data with sector-specific policies. Then, it estimated the climate-smart investment potential for the power, transport, buildings, waste and industry sectors by assessing how their NDC targets would affect the market size over the time period of implementing the NDCs. Finally, investment or capital costs (USD/MW) were used to derive the final investment potential estimates. To improve accuracy, these estimates were complemented by individual project-level data, publicly available data, or private subscription-based references. Later reports in the series focus on South Asia (and an additional four countries) and on cities that extrapolated investments needs based on urban populations in emerging markets and developing economies.	
UNEP Adaptation Finance Gap Report, 2014, 2016 and 2018; regional Adaptation Gap Reports	Informed by in-depth and bottom-up reviews of national and sector-level studies, the reports assess likely increases in adaptation costs using a World Bank 2010 study on the economics of adapting to climate change (USD 70–100 billion per year) to take account of country coverage and higher warming pathways (greater than 2 °C) (Margulis et al, 2010).	
World Bank Beyond the Gap (Rozenberg and Fay, 2019)	The study adopts sector-specific approaches to identifying costs based on policy priorities, technology choices and trade-offs. SDG objectives and climate goals on access in water and sanitation, irrigation, transport, power and flood protection are used across sectors as policy priorities.	Technology cost choices, population growth, climate impacts, dietary patterns and carbon prices.
Hallegatte et al. (2019)	Using estimates on infrastructure needs in Rozenberg and Fay (2019), this analysis estimates incremental costs to climate-proof resilience of new investment. Technical options to reduce hazard risk exposure (Miyamoto, 2019) to specific infrastructure assets are used to aggregate estimates.	Incremental costs range from 1 to 5 per cent of baseline cost, (3 per cent average). Improved quality control is required to ensure that an asset is built and maintained to expected standards. Miyamoto International (2019) estimates that this quality control costs from 1 to 5 per cent of the value for most assets and hazards, but it can cost up to 15 per cent (e.g. ensuring that drainage systems can cope with earthquake motion, and that highway systems can cope with flooding). This quality control would accompany the good procurement practices that are key to lower infrastructure construction costs.

Source	Methodology	Main assumptions
IMF Fiscal Monitor 2020: **Estimating the Adaptation Costs of Investing in the Resilience of Physical Assets**	The study analyses two natural hazards (floods and cyclones) and three types of adaptation costs: (1) retrofitting existing economic assets exposed to natural hazards to improve their resilience, (2) upgrading projected investment in all sectors to improve resilience to natural hazards, and (3) building coastal protection infrastructure. Upgrading and retrofitting costs are estimated using a bottom-up approach based on country exposure to natural hazards and the additional costs that would be incurred to make exposed assets more resilient. The analysis uses a new database in which the shares of exposed assets by country are inferred from cross-referencing two detailed global maps, one of natural hazards and another of road and railway asset data (Koks et al., 2019). The incremental costs of making exposed assets more resilient are estimated using the average values corresponding to the set of technical options from Miyamoto International (2019). Coastal protection costs are the as-yet-unreported country-level estimates corresponding to the global levels presented in Rozenberg and Fay (2019). The annual investment and maintenance costs are reported for the economically optimal level of protection, defined as the level that minimizes the sum of protection costs (capital and maintenance) and residual flood damage to assets up until 2100. The full level of protection is assumed to be reached by 2030, with disbursements spread equally over the years. The estimation uses the state-of-the-art Dynamic Interactive Vulnerability Assessment (DIVA) climate model and new projections of coastal protection construction costs (Nicholls et al., 2019).	Based on the exposure and incremental cost measures, the following are estimated: • Upgrading costs are computed as the annual investment projections on average over 2020–2025, multiplied by the estimated share of exposed assets, and by a unit cost of 15 per cent (Rozenberg and Fay, 2019). Hence, the average exposure of future projects is assumed to be the same as the exposure of existing assets. Public and private investment projections are from the 2020 World Economic Outlook. When projections are unavailable, it is assumed that future investment-to-GDP ratios remain constant at the last observed level in IMF's 2019 Investment and Capital Stock Dataset. • Retrofitting costs are computed as the public capital stock (from IMF's 2019 Investment and Capital Stock Dataset), multiplied by the estimated share of exposed assets and by a unit cost of 50 per cent (Rozenberg and Fay, 2019). The total costs are annualized by assuming constant disbursement in per cent of GDP over the next 10 years. Note that it may be more cost-effective to abandon some exposed assets or tear them down and rebuild them better. The unit cost of 50 per cent would also correspond to an average view between these cases. When considering the different assumptions regarding socioeconomic projections, unit costs, and GHG concentration pathways, average specifications are used.

Source	Methodology	Main assumptions
Meeting Asia's Infrastructure Needs (ADB, 2017)	Estimates for climate change mitigation and adaptation are added to baseline infrastructure investment needs. For mitigation, the World Induced Technical Change Hybrid model is used in the power sector to assess changes in infrastructure costs in an optimal 2 °C scenario. For adaptation, climate proofing as a percentage of baseline investment from ADB project experience in the water and sanitation sector and recent studies that conduct such estimations for the transport and power sectors.	The data used to estimate the infrastructure needs are as follows: GDP per capita, country land area, population and urban population, agriculture, manufacturing value added shares to GDP, railroad length, fixed-telephone line subscriptions, mobile cellular subscriptions, container port traffic, air transport passengers, improved water source and sanitation facilities (per cent of population with access), road length, broadband subscriptions, and electricity generation capacity. Based on a recent ADB project database, 'climate proofing' related investments account for 1.9 per cent of the total baseline investments in the water and sanitation sector. The median estimates in recent studies (i.e. ADB, 2014; UNFCCC, 2007; World Bank, 2010) suggest 7.8 per cent for road, 0.6 per cent for rail, seaport and airport, and 0.4 per cent for power.
Needs of African countries related to implementing the United Nations Framework Convention on Climate Change and the Paris Agreement (AfDB, 2021)	This report provides a desk review of AfDB's documents covering all 54 member States and stakeholder consultations providing the basis for the determination of needs in five principal thematic areas: technical and technological needs, adaptation, mitigation, climate financing environment, and capacity-building (including institutional strengthening and reform).	Carbon price of USD 100 t/CO2eq for emission reductions in conditional NDC targets Sixfold to tenfold increase by 2030 in stated NDC adaptation costs in 2020.
GIZ: **Climate Finance Readiness Analysis,** **Smart National Adaptation Planning Tool (SNAP), and support for TNAs under the UNFCCC**	Each tool uses its own uniquely adapted methodology. GIZ has developed a methodology that includes both political and economic considerations in order to develop capacity development strategies tailored to the partner country context. The approach supports a systematic diagnostic of relative strengths, weaknesses, opportunities and threats in existing systems, complemented by prioritization and decision-making tools. The methodology has been applied in 22 cases in Africa, as well as in Myanmar, Jordan and Armenia. The capacity assessment methodology: This includes and focuses on defining the objectives; analysing the context; identifying strengths, weaknesses and opportunities; developing and assessing strategic options; and formulating a strategy.	
Performance-based climate resilience grants (PBCRGs):	The LoCAL facility has an innovative method to channel climate finance and incentivize continuous improvement in responses to climate change at the subnational and grass-roots levels. Performance-based climate resilience grants provide a financial top-up to cover the additional costs of making interventions climate-resilient. They complement regular allocations made at the central level to local governments through the intergovernmental fiscal transfer system thereby ensuring additionality.	
Assessing Climate Change Adaptation Framework (ACCAF)	This is a multi-country monitoring and evaluation framework for reviewing the effectiveness of the performance-based grant mechanism in producing investments. The framework provides a step- by- step exercise that begins with the development context and need and moves into a nested adaptation context and need intended to help local stakeholders articulate why and how the interventions address adaptation needs.	

Source	Methodology	Main assumptions
Impact and Vulnerability Analysis of Vital Infrastructures and built-up Areas (IVAVIA)	Practical guidelines for conducting vulnerability assessments of urban areas and their infrastructure were developed in the framework of the European project "Climate Resilient Cities and Infrastructures". (The IVAVIA methodology is designed to guide a risk-based vulnerability assessment, helping users to map, analyse and communicate the impact of climate trends and weather events on key elements of a city's physical, social and economic fabric.	
Good Practice Study on Principles for Indicator Development, Selection, and Use in Climate Change Adaptation Monitoring and Evaluation	Developed by the community of practice Earth-Eval, which documents good practices and related principles on the development, selection, and use of indicators used in the monitoring and evaluation of adaptation interventions.	

Annex G. Work undertaken by other constituted bodies under the UNFCCC

Mandates for the Adaptation Committee and the LEG, together with the SCF and other relevant institutions, to develop methodologies for reviewing the adequacy and effectiveness of adaptation and support, and for the LEG and the Adaptation Committee NAP task force to consider gaps and needs related to the process to formulate and implement NAPs that have been identified through the relevant work of the LEG and the Adaptation Committee, as well as how to address them and include relevant information thereon in their respective reports to COP 25[37].
Mandates for the Adaptation Committee to consider methodologies for assessing adaptation needs with a view to assisting developing country Parties, without placing an undue burden on them, and also for the Adaptation Committee, to develop by June 2020, and to regularly update an inventory of relevant methodologies for assessing adaptation needs, including needs related to action, finance, capacity-building and technological support in the context of national adaptation planning and implementation, and to make the information available on the adaptation knowledge portal.[38]
The Adaptation Committee workplan for 2019–2021, which includes an objective under workstream B to provide guidance with a view to enhancing capacity-building for adaptation action, related submissions from Parties,[39] and an information document[40] on capacity gaps in accessing adaptation funding, including their experience, successes and remaining challenges.
The CGE supports the implementation of the ETF under Article 13 of the Paris Agreement, by, inter alia, facilitating the provision of technical advice and support to developing country Parties, as applicable. As part of its 2020 workplan, the CGE continued conducting an assessment of the existing and emerging constraints and challenges, lessons learned and capacity-building needs of developing country Parties in implementing the existing MRV arrangements under the Convention and preparing for the ETF under the Paris Agreement, updating a 2019 technical paper.[41]
The PCCB national-level pilot exercise on assessing capacity gaps and needs related to NDC implementation, which produced a technical paper[42] that compiles submissions from Parties[43] and complements the national-level assessments of capacity gaps and needs with insights gained through desk research and interviews.

37) Decision 8/CP.24, paras. 17–18. More information is contained in, inter alia, AC document AC/2019/23, available at https://unfccc.int/sites/default/files/resource/ac16_7a_gaps_needs_naps.pdf.

38) By decision 11/CMA.1, para. 15, the CMA requested the AC to collaborate on assessing adaptation needs with the LEG, partner organizations of the Nairobi work programme, and users and developers of relevant methodologies, including academia and the private sector. More information is available in the relevant concept note (AC document AC/2019/2020, available at https://unfccc.int/sites/default/files/resource/AC per cent2016 per cent20needs per cent20assessment per cent20inventory_2019.08.15.pdf).

39) Available at https://unfccc.int/topics/adaptation-and-resilience/groups-committees/adaptation-committee/adaptation-committee-call-for-submissions-on-parties-capacity-gaps-in-accessing-adaptation-funding.

40) Available at https://unfccc.int/sites/default/files/resource/ac17_9b_cb_financing.pdf.

41) https://unfccc.int/process-and-meetings/bodies/constituted-bodies/consultative-group-of-experts-cge/transparency-needs-assessment#eq-1
Updated technical paper available at: https://unfccc.int/sites/default/files/resource/tp2020_01.pdf.

42) Available at https://unfccc.int/sites/default/files/resource/PCCB_TP_capacity per cent20gaps per cent20and per cent20needs_NDCs_final.pdf.

43) Submissions were received from Burundi, the Dominican Republic, Georgia, Guatemala, Indonesia and Saint Lucia.

Annex H. List of references

AfDB. 2021a. *Needs of African Countries Related to Implementing the UN Framework Convention on Climate Change and the Paris Agreement*. Available at https://unfccc.int/sites/default/files/resource/Needs%20Report_African%20counties_AfDB_FINAL.pdf.

AfDB. 2021b. *Country groupings*, Available at https://www.afdb.org/en/countries.

AILAC. 2020. *Needs of AILAC countries in the implementation of the Convention and the Paris Agreement.* Available at https://unfccc.int/sites/default/files/resource/AILAC%20Needs.pdf.

Amarasinghe U, Shah T, Turral H and Anand B.K *India's water future to 2025-2050. Business as usual scenario and deviations.* Colombo, Sri Lanka: International Water Management Institute. 47p.

Amellina A. 2017. *MRV System in Climate Change. From Kyoto to Paris. Institute for Global Environmental Strategies (IGES).* Available at https://www.iges.or.jp/en/publication_documents/pub/presentation/en/6438/02_MRV+System+in+Climate+Change+Context_Amellina_rev.pdf.

ADB 2014. *Key Indicators for Asia and Pacific.* Available at https://www.adb.org/sites/default/files/publication/43030/ki2014.pdf.

ADB. 2017. *Meeting Asia's Infrastructure Needs*. Manila. Available at https://www.adb.org/publications/asia-infrastructure-needs.

Baker-Gallegos J.and Harsdorff M. 2019. *The Socioeconomic Impacts of the Nationally Determined Contributions (NDCs).* Green Jobs Assessment Institutions Network. International Labour Organization, 19 July 2019, Webinar. Available at https://www.ilo.org/global/topics/green-jobs/areas-of-work/gain/webinars/WCMS_712190/lang--en/index.htm.

Bird N, Beloe T, Hedger M, Lee J, Nicholson K, O'Donnell M, Gooty S, Heikens A, Steele P, Mackay A and Miller M. 2012. *Climate Public Expenditure and Institutional Review (CPEIR) Methodological Note. A methodology to review climate policy, institutions and expenditure. A joint UNDP/ODI working paper.* Available at https://www.asia-pacific.undp.org/content/rbap/en/home/library/democratic_governance/CPEIR-methodological-note.html.

Beveridge L, Whitfield S. and Challinor A. 2018. Crop modelling: towards locally relevant and climate-informed adaptation. *Climatic Change* 147, 475–489. Available at https://link.springer.com/article/10.1007/s10584-018-2160-z.

Christensen J.H, Hewitson B, Busuioc A, et al. 2007. *Regional Climate Projections*United Kingdom and New York, NY, USA: Cambridge University Press. Available at https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter11-1.pdf.

Climate Action Tracker. 2017. *Countries Rating System.* Available at https://climateactiontracker.org/countries/rating-system/.

Climate Action Tracker. 2021.*CAT Rating methodology.* Available at https://climateactiontracker.org/methodology/cat-rating-methodology/.

Dietz S. unknown. Economic models of climate change. *Centre for Climate Change Economics and Policy and the Grantham Research Institute on Climate Change and Environment LSE.* Available at https://www.cccep.ac.uk/wp-content/uploads/2015/10/symp1_05_Dietz.pdf.

Dzebo A, Janetschek H, Brandi C, et al. 2019.Connections between the Paris Agreement and the 2030 Agenda. The case for policy coherence. Available at https://www.sei.org/publications/connections-between-the-paris-agreement-and-the-2030-agenda/.

Ekins P and Fabian K, and Smith Z P. 2011. Marginal Abatement Cost Curves: A call for caution. *UCL Energy Institute Report.* Available at http://www.homepages.ucl.ac.uk/~ucft347/MACCCritGPUKFin.pdf.

Field C, Barros V, Mach K, et al. 2014. Technical summary. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* United Kingdom and New York, NY, USA: Cambridge University Press . Cambridge pp.35–94.Available at https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-TS_FINAL.pdf.

Forzieri G, Feyen L, Russo S, et al. 2016. Multi-hazard assessment in Europe under climate change. *Climatic Change. 137*(1): pp.105–119.

Furlan M and Mariano E. 2021. Guiding the nations through fair low-carbon economy cycles: A climate justice index proposal, *Ecological Indicators.* Vol. 125: pp.1–14. Available at https://doi.org/10.1016/j.ecolind.2021.107615*GCF Board document GCF/B.21/Inf.03/Add.01. Available at* https://www.greenclimate.fund/boardroom/documents.

Global Forest Observation Initiative. 2013. *The IPCC Tier Concept. In: Integrating remote-sensing and ground-based observations for estimation of emissions and removals of greenhouse gases in forests: Methods and Guidance from the Global Forest Observations Initiative.* Geneva, Switzerland: Group on Earth Observations. Available at https://redd.unfccc.int/uploads/2_77_redd_20140218_mgd_report_gfoi.pdf.

Global Commission on Adaptation. 2019. A*dapt Now. A global call for leadership on climate resilience.* Available at https://gca.org/wp-content/uploads/2019/09/GlobalCommission_Report_FINAL.pdf.

Government of Algeria. 2016. *Algeria First INDC Translation*. Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Algeria%20First/Algeria%20-%20INDC%20(English%20unofficial%20translation)%20September%2003,2015.pdf.

Government of Belize. 2016. *Third national communication.* Available at https://unfccc.int/sites/default/files/resource/blznc3.pdf.

Government of Burkina Faso. 2015. *Burkina Faso National Climate Change Adaptation Plan*. Available at https://www4.unfccc.int/sites/NAPC/Documents/Parties/Burkina%20Faso%20NAP_English.pdf.

Government of Colombia. 2020. *Colombia's NDCs, updated version*. Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Colombia%20First/NDC%20actualizada%20de%20Colombia.pdf.

Government of Ecuador. 2013. *Second technology needs assessment. Summary*. Available at https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNR_CRE/e9067c6e3b97459989b2196f12155ad5/e29e82db22de4dad89b7c4eb8a32d8f1.pdf.

Government of Ethiopia. 2020. *First NDC. Updated Submission.* Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Ethiopia%20First/Ethiopia%27s%20NDC%20update%20summary%202020.pdf.

Government of Mexico. 2020. *Nationally Determined Contributions. 2020 Update.* Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Mexico%20First/NDC-Eng-Dec30.pdf.

Government of Morocco. 2016. First NDC. Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Morocco%20First/Morocco%20First%20NDC-English.pdf.

Government of Peru. 2020. *Peru First NDC (Updated submission).* Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Peru%20First/Reporte%20de%20Actualizacio%CC%81n%20de%20las%20NDC%20del%20Peru%CC%81.pdf.

Government of the Republic of Moldova. 2018. *Fourth national communication*. Available at https://cop23.unfccc.int/sites/default/files/resource/Moldova_CN4_En_web_070218.pdf.

Government of Samoa. 2010. *Second national communication*. Available at https://unfccc.int/sites/default/files/resource/SNC_Samoa_2010_final.pdf.

Government of Solomon Islands. 2016. *Solomon Islands. First INDC.* Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Solomon%20Islands%20First/SOLOMON%20ISLANDS%20INDC.pdf.

Government of South Africa. 2016. *South Africa First INDC.* Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/South%20Africa%20First/South%20Africa.pdf.

Government of Sri Lanka. 2016. *Climate Adaptation Plan for Climate Change Impacts in Sri Lanka. 2016-2025.* Available at https://www4.unfccc.int/sites/NAPC/Documents%20NAP/National%20Reports/National%20Adaptation%20Plan%20of%20Sri%20Lanka.pdf.

Government of Sri Lanka. 2016. *Sri Lanka First NDC.* Available at https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Sri%20Lanka%20First/NDCs%20of%20Sri%20Lanka.pdf.

Government of *St. Vincent and the Grenadines. 2019. National adaptation plan for St. Vincent and the Grenadines.* Available at https://www4.unfccc.int/sites/NAPC/Documents/Parties/FINAL%20NAP_SVG_Approved.pdf.

Government of Viet Nam. 2017. *Second biennial update report. A*ailable at: https://unfccc.int/sites/default/files/resource/97620135_Viet%20Nam-BUR2-1-Viet%20Nam%20-%20BUR2.pdf.

Greenhouse Gas Protocol. 2021. *Calculation Tools.* Available at https://ghgprotocol.org/calculation-tools#country_specific_tools_id.

Gutowski Jr W J, Giorgi F, Timbal B, et al.. WCRP COordinated Regional Downscaling EXperiment (CORDEX). A diagnostic MIP for CMIP6, *Geosci. Model Dev.*, 9, 4087–4095, https://doi.org/10.5194/gmd-9-4087-2016, 2016.

Hallegatte S, Rentschler J, Rozenberg J. 2019. *Lifelines. The Resilient Infrastructure Opportunity. Sustainable Infrastructure*. Washington, DC: World Bank. Available at https://openknowledge.worldbank.org/handle/10986/31805.

Heaps C. unknown. *Using LEAP for GHG Mitigation Assessment*. Stockholm Environment Institute. Available at https://unfccc.int/sites/default/files/resource/LEAP%20UNFCCC%20Nov%202018.pdf.

IPCC. 2000. *IPCC Special Report Emissions Scenarios. Summary for Policymakers. Special Report of IPCC Working Group III*.pp.1–27. Available at https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf.

IPCC. 2012. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* United Kingdom and New York, NY, USA: Cambridge University Press, Cambridge..

Available at https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-5-4-1.html.

IPCC. 2018. Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty Intergovernmental Panel on Climate Change (2014): *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Geneva, Switzerland: IPCC.pp.151.

IEA. 2019. *World Energy Investment 2019*. Available at https://iea.blob.core.windows.net/assets/c299fa1e-f2f4-4b81-bfb2-672d3a50ccab/WEI2019.pdf.

IEA. 2020. *World Energy Model Documentation*. Available at https://iea.blob.core.windows.net/assets/bc4936dc-73f1-47c3-8064-0784ae6f85a3/WEM_Documentation_WEO2020.pdf.

IFC. 2016. *Climate investment opportunities in emerging markets*. Available at https://www.ifc.org/wps/wcm/connect/59260145-ec2e-40de-97e6-3aa78b82b3c9/3503-IFC-Climate_Investment_Opportunity-Report-Dec-FINAL.pdf?MOD=AJPERES&CVID=lBLd6Xq.

IFC. 2017. *Climate Investment Opportunities in South Asia. An IFC Analysis.* Available at https://www.ifc.org/wps/wcm/connect/fa3bea68-20f1-4cb4-90b9-3e812d38067f/Climate+Investment+Opportunities+in+South+Asia+-+An+IFC+Analysis.pdf?MOD=AJPERES&CVID=l.raVua.

IFC. 2018. *Climate Investment Opportunities in Cities. An IFC Analysis.* Available at https://www.ifc.org/wps/wcm/connect/875afb8f-de49-460e-a66a-dd2664452840/201811-CIOC-IFC-Analysis.pdf?MOD=AJPERES&CVID=mthPzYg.

IFC. 2020. *Fiscal Monitor: Policies for the Recovery*. Washington, October. Available at https://www.imf.org/en/Publications/FM/Issues/2020/09/30/october-2020-fiscal-monitor#Full%20Report%20and%20Executive%20Summary.

IRENA. 2019. *Transforming the energy system – and holding the line on rising global temperatures*, International Renewable Energy Agency, Abu Dhabi.

IRENA. 2020. *Global Renewables Outlook. Energy transformation 2050*. International Renewable Energy Agency, Abu Dhabi.

Koks E E, Rozenberg J, Zorn C, et al. 2019. A global multi-hazard risk analysis of road and railway infrastructure assets. *Nature communications*, *10*(1): pp.1–11.

LDCs Expert Group. 2012. *National Adaptation Plans. Technical guidelines for the national adaptation plan process.* UNFCCC. Available at https://unfccc.int/files/adaptation/cancun_adaptation_framework/national_adaptation_plans/application/pdf/naptechguidelines_eng_low_res.pdf.

Liu Y and Weisberg R H. 2011. A Review of Self-Organizing Map Applications in Meteorology and Oceanography, Self Organizing Maps - Applications and Novel Algorithm Design. Dr Josphat Igadwa Mwasiagi (Ed.), ISBN: 978-953-307-546-4, InTech, Available at https://www.intechopen.com/books/self-organizing-maps-applications-and-novel-algorithm-design/a-review-of-self-organizing-map-applications-in-meteorology-and-oceanography.

LoCAL. 2020a. Submission by the Local Climate Adaptive Living (LoCAL) facility of the UN Capital Development Fund (UNCDF) to the call for evidence for information and data for the preparation of the 2020 report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement. Available at https://unfccc.int/sites/default/files/resource/LoCAL%20inputs%20to%20Report%20on%20Determination%20of%20the%20needs%20of%20developing%20countries.pdf.

LoCAL. 2020b. Submission by the Local Climate Adaptive Living (LoCAL) facility of the UN Capital Development Fund (UNCDF) to the call for evidence for information and data for the preparation of the 2020 report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement. Available at https://unfccc.int/sites/default/files/resource/LoCAL%20inputs%20to%20Report%20on%20Determination%20of%20the%20needs%20of%20developing%20countries.pdf.

Lütken S, Dransfeld B, Wehner S, et al. 2013 *Guidance for NAMA Design. Building on Country Experiences. UNFCCC, UNEP and UNDP Report. pp.1–104.* Available at https://unfccc.int/files/cooperation_support/nama/application/pdf/guidance_for_nama_design_(2013)_final.pdf.

Margulis, Sergio & Narain, Urvashi & Chinowsky, Paul & Cretegny, Laurent & Hughes, Gordon & Kirshen, Paul & Kuriakose, Anne & Lange, Glenn & Nelson, Gerald & Neumann, James & Nicholls, Robert & Pandy, Kiran & Price, Jason & Schlosser, Adam & Schneider, Margulis S, Narain U, Chinowsky P, et al. 2010. *The Cost to Developing Countries of Adapting to Climate Change: New Methods and Estimates*. Washington DC, USA: World Bank Available at https://www.researchgate.net/publication/258883035_The_Cost_to_Developing_Countries_of_Adapting_to_Climate_Change_New_Methods_and_Estimates.

Marques A, Deng-Beck C, van Staden M, et al. 2016. *From strategy to delivery. Measuring, Reporting, Verification (MRV) of Urban Low Emission Development. ICLEI's GreenClimateCities Handbook for Local Governments. Report ICLEI Local Governments for Sustainability.*

Available at *https://e-lib.iclei.org/wp-content/uploads/2016/05/GCC_Handbook_final-web1.pdf.*

McCollum D L, Zhou W, Bertram C, et al. .2018. Energy investment needs for fulfilling the Paris Agreement and achieving the Sustainable Development Goals. *Nature Energy*. 3(7): pp.589–599.

Meehl G, Stocker T, Collins W, et al 2007. *Global Climate Projections.* In: Climate Change 2007: *The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* United Kingdom and New York, NY, USA: Cambridge University Press.Available at https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter10-1.pdf.

Ministry of Environment, Forests and Climate Change, Government of India. 2014. *A Framework for Climate Change Vulnerability Assessments.* Available at https://www.adaptationcommunity.net/?wpfb_dl=236.

Miyamoto M, and Takeuchi K. 2019. Climate agreement and technology diffusion: Impact of the Kyoto Protocol on international patent applications for renewable energy technologies. *Energy Policy*. *129:pp*1331–1338.

New Climate Institute. 2017. *Climate Action Tracker launches new rating system*. Available at https://newclimate.org/2017/09/19/climate-action-tracker-launches-new-rating-system/.

Olsson P, Galaz V, and Boonstra W. 2014. Sustainability transformations: a resilience perspective. *Ecology and Society*, *19*(4).

Republic of Fiji. 2018. *National adaptation plan. A pathway towards climate resilience*. Available at https://www4.unfccc.int/sites/NAPC/Documents/Parties/National%20Adaptation%20Plan_Fiji.pdf.

Revet D. 2016. *The Key Category Analysis. Africa Regional Workshop on the Building of Sustainable National Greenhouse Gas Inventory Management Systems, and the Use of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.* UNFCCC. Available at https://unfccc.int/sites/default/files/5_-_key_category_analysis_rev2.pptx.pdf.

Rozenberg J, and Fay M .2019. *Beyond the gap: How countries can afford the infrastructure they need while protecting the planet*. World Bank Publications.

Rypdal K, Paciornik N, Eggleston S, et al. 2006. *Chapter 1. Introduction to the 2006 Guidelines. 2006 IPCC Guidelines for National Greenhouse Gas Inventories*, Vol.1: General Guidance and Reporting.pp.1.1–1.12. Available at https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_1_Ch1_Introduction.pdf. .

Sarma K, and Haraguchi K. 2020. *Technology Development and Transfer.* Available at https://www.ipcc.ch/site/assets/uploads/2018/03/ipcc_far_wg_III_chapter_08.pdf.

Serebrisky T.2014. *Sustainable Infrastructure for competitiveness and inclusive growth*, IADB. Available at https://publications.iadb.org/publications/english/document/Sustainable-infrastructure-for-competitiveness-and-inclusive-growth.pdf.

Steele Pl and Patel S. 2020. *Tackling the Triple Crisis. Using Debt Swaps to Address Debt, Climate and Nature Loss Post-COVID-19.* Available at https://pubs.iied.org/16674iied.

Taylor S W, and Alexander M E. 2003. Considerations in developing a national forest fire danger rating system. In *XII World Forestry Congress, Quebec, Canada*. Available at http://www.fao.org/3/XII/0726-B1.htm.

Teng F, Shuang-Qing X. 2021. Definition of Business as Usual and Its Impacts on Assessment of Mitigation Efforts. *Advances in Climate Change Research*. Vol. 3(4) : pp. 212–219.

The Commonwealth. 2021. *Response from the Commonwealth Secretariat to the UNFCCC Adaptation Committee's Call for Submissions on Methodologies for Assessing Adaptation Needs.* The Climate Finance Hub.

United Nations Committee for Policy Development. 2021. *List of Least Developed Countries* (*as of February 2021).* Available at https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdfb.

United Nations Department of Economic and Social Affairs. (unknown): *Small Island Developing States. UN Members.* Available at https://sustainabledevelopment.un.org/topics/sids/list.

United Nations Department of General Assembly and Conference Management. unknown. *Regional groups of Member States.* Available at https://www.un.org/dgacm/en/content/regional-groups.

United Nations Development Programme. 2007. *Fighting Climate Change. Human Solidarity in a Divided World. Human Development Report 2007/2008*. New York: Palgrave Macmillan.

United Nations Development Programme. 2018. *Cost-benefit analysis for climate change adaptation policies and investments in the agriculture sectors.* Available at http://www.fao.org/3/I8905EN/i8905en.pdf.

UNEP. 2015. *Africa's Adaptation Gap 2. Bridging the Gap – Mobilizing sources.* United Nations Environment Programme. Nairobi.

UNEP. 2015b. *Indicators for Green Economy Policymaking – A Synthesis Report of Studies in Ghana, Mauritius and Uruguay*. Available at https://www.greengrowthknowledge.org/sites/default/files/downloads/resource/Indicators_for_Green_Economy_Policy_Making_A_Synthesis_Report_of_Studies_in_Ghana_Mauritius_and_Uruguay_UNEP.pdf.

UNEP. 2016. *The Adaptation Finance Gap Report 2016*. United Nations Environment Programme. Nairobi, Kenya.

UNEP DTU Partnership. 2021. *The Greenhouse Gas Abatement Cost Model (GACMO).* Available at https://unepdtu.org/publications/the-greenhouse-gas-abatement-cost-model-gacmo/.

UNEP DTU Partnership and the Fijian Ministry of Economy. 2020. *Technology Needs Assessment Report Adaptation*. Available at https://tech-action.unepdtu.org/wp-content/uploads/sites/2/2020/05/tna-adaptation-report-fiji.pdf.

United Nations Executive Office of the Secretary-General and United Nations Framework Convention on Climate Change. 2017. *Catalyzing the Implementation of Nationally Determined Contributions in the Context of the 2030 Agenda through South-South Cooperation.* Available at http://unfccc.int/files/resource_materials/application/pdf/ssc_ndc_report.pdf.

UNFCCC. unknown. *MRV Framework for Non-Annex I Parties under the UNFCCC*. Available at https://unfccc.int/sites/default/files/unfcccnon-annex_i_mrv_framework.pdf.

UNFCCC. 2008. *Resource Guide for Preparing the National Communications of Non-Annex I Parties, Module 2: Vulnerability and Adaptation to Climate Change.* Available at https://unfccc.int/resource/docs/publications/08_resource_guide2.pdf.

UNFCCC. 2011. *Assessing the Costs and Benefits of Adaptation Options. An Overview of Approaches. The Nairobi Work Programme On Impacts, Vulnerability And Adaptation To Climate Change Report.* Available at https://unfccc.int/resource/docs/publications/pub_nwp_costs_benefits_adaptation.pdf.

UNFCCC. 2014. *Handbook on Measurement, Reporting and Verification for Developing Country Parties.* Available at https://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/non-annex_i_mrv_handbook.pdf.

UNFCCC. 2019. *Clean Development Mechanism Methodology Booklet*. Bonn, Germany: UNFCCC, 11th edition, pp. 1–277. Available at https://cdm.unfccc.int/methodologies/documentation/2003/CDM-Methodology-Booklet_fullversion.pdf.

UNFCCC. 2021a. *CGE training materials – Mitigation assessment. Module E. Mitigation Analysis: Methods and Tools.* Available at https://unfccc.int/sites/default/files/resource/module-e-notes1_rev_2021.pdf.

UNFCCC. 2021b. *Warsaw Framework for REDD+.* Available at https://unfccc.int/topics/land-use/workstreams/redd/what-is-redd.

UNFCCC. 2021c. *Technology Transfer Framework.* Available at http://unfccc.int/ttclear/tec/ tech-transfer-framework.html.

UNFCCC. 2021d. *Technology Needs Assessment Pathways for Climate Tech Implementation*. Available at https://unfccc.int/ttclear/tna.

UNFCCC. 2021e. *Community Vulnerability Assessment Tool (CVAT).* Available at https://www4.unfccc.int/sites/NWPStaging/Pages/item.aspx?ListItemId=22891&ListUrl=/sites/NWPStaging/Lists/MainDB#:~:text=Community%20Vulnerability%20Assessment%20Tool%20(CVAT)%20supports%20the%20linking%20of%20environmental,a%20series%20of%20existing%-20threats.&text=Mitigation%20opportunities%20analysis.

UNFCCC. 2021f. *Community Vulnerability Assessment Tool (CVAT).* Available at https://www4.unfccc.int/sites/NWPStaging/Pages/item.aspx?ListItemId=22891&ListUrl=/sites/NWPStaging/Lists/MainDB#:~:text=Community%20Vulnerability%20Assessment%20Tool%20(CVAT)%20supports%20the%20linking%20of%20environmental,a%20series%20of%20existing%-20threats.&text=Mitigation%20opportunities%20analysis. https://www.sprep.org/att/publication/000437_CVAGuideE.pdf.

UNFCCC. 2021g. *Technology Needs Assessment Pathways for Climate Tech Implementation*. Available at https://unfccc.int/ttclear/tna.

UNFCCC and UNEP DTU Partnership. 2016. *Enhancing Implementation of Technology Needs Assessments, Guidance for Preparing a Technology Action Plan.* Available at https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TEC_column_M/33933c6ccb7744bc8fd643feb0f8032a/82af010d04f14a84b9d24c5379514053.pdf.

Vertenstein M, Craig T, Middleton A, et al(unknown): CCSM4.0 User's Guide. Available at https://www.cesm.ucar.edu/models/ccsm4.0/ccsm_doc/ug.pdf.

Wealth Accounting and the Valuation of Ecosystem Services. 2021. *Wealth Accounting and WAVES.* Available at https://www.wavespartnership.org/.

Women's Environment and Development Organization. 2020. Submission by the Women's Environment and Development Organization (WEDO) supported by the Heinrich Böll Stiftung Washington, DC. In response to the *Call for evidence: information and data for the preparation of the 2020 Report on the determination of the needs of developing country Parties related to implementing the*

Convention and the Paris Agreement. Available at *https://unfccc.int/sites/default/files/resource/SCF_CallforEvidenceNDR_WEDO.pdf.*

World Bank. 2009. The Costs to Developing Countries of Adapting to Climate Change: New Methods and Estimates. The Global Report of the Economics to Adaptation to Climate Change Study. Washington, D.C. : World Bank Group.

World Bank. 2016. *Climate and Disaster Resilience in the Pacific. pp.30–31*. Available at https://thedocs.worldbank.org/en/doc/720371469614841726-0070022016/original/PACIFICPOSSIBLEClimate.pdf.

World Resource Institute. 2021. *What is an INDC?* Available at https://www.wri.org/indc-definition.

World Resources Institute and World Business Council for Sustainable Development. 2004. *The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standard.* Available at https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf.

FOR FURTHER INFORMATION CONTACT

Climate Finance subdivision
Means of Implementation division

United Nations Climate Change Secretariat (UNFCCC)
Platz der Vereinten Nationen 1
53113 Bonn, Germany

E-mail: standingcommittee@unfccc.int

United Nations
Framework Convention on
Climate Change