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Problems, constraints, lessons learned and capacity-building needs in preparing national communications, biennial update reports and biennial transparency reports

Updated technical paper by the Consultative Group of Experts

Summary

This updated technical paper compiles and synthesizes information on problems, constraints, lessons learned and capacity-building needs identified by developing country Parties during the preparation of national communications, biennial update reports and biennial transparency reports. The paper will continue to inform the work of the Consultative Group of Experts in identifying and providing technical assistance to address the needs of developing country Parties in this regard and serve as a source of lessons learned for those Parties.



Abbreviations and acronyms

BTR	biennial transparency report
BUR	biennial update report
CGE	Consultative Group of Experts
ETF	enhanced transparency framework under the Paris Agreement
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
LDC	least developed country
MPGs	modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement
MRV	measurement, reporting and verification
NC	national communication
NDC	nationally determined contribution
PEG M&E tool	tool for monitoring and evaluating progress, effectiveness and gaps in relation to the process to formulate and implement national adaptation plans
QA/QC	quality assurance/quality control
SBI	Subsidiary Body for Implementation
SIDS	small island developing State(s)
TASR*	summary report on the technical analysis of a biennial update report
TERR*	report on the technical expert review of a biennial transparency report

* Used exclusively in figure 1.

I. Introduction

A. Mandate

1. The Conference of the Parties at its thirtieth session adopted the revised terms of reference of the CGE,¹ which state that, in fulfilling its mandate to support implementation of the MRV arrangements and the ETF, the CGE shall:²

(a) Provide, as appropriate, taking into account paragraphs 38 and 43(a–b) of decision [1/CP.24](#), technical assistance and support to Parties not included in Annex I to the Convention to facilitate the process of and the preparation of their NCs³ and BURs, as applicable, in accordance with the “Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention”, contained in the annex to decision [17/CP.8](#), and the “UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention”, contained in annex III to decision [2/CP.17](#);

(b) Facilitate the provision of technical advice and support to developing country Parties, including for the preparation and submission of their BTRs, and facilitate improved reporting over time in accordance with the MPGs,⁴ as applicable.

2. As per the revised terms of reference,⁵ the CGE, in providing technical advice and support, should, to the extent possible, identify and take into account, as appropriate, lessons learned and best practices, and the challenges, constraints and needs of developing country Parties pertaining to preparing, as appropriate, NCs, BURs and BTRs, including in relation to financial and other support available, as well as the areas for improvement and capacity-building needs identified in BTRs, technical analyses of BURs and technical expert reviews of BTRs.

3. In addition, SBI 63 requested the CGE, in developing and implementing its workplan for 2026, to consider, to the extent possible, including the activity of continuing to prepare updates of the technical paper on problems, constraints, lessons learned and capacity-building needs in preparing NCs, BURs and BTRs.⁶

B. Scope

4. In response to guidance from the SBI⁷ and as part of its workplan for 2026⁸ developed at its 14th meeting, the CGE agreed to continue conducting an assessment of the existing and emerging problems and constraints encountered by developing country Parties in implementing the MRV arrangements and the ETF, as well as lessons learned and capacity-building needs, and to update the technical paper prepared in 2025.⁹

5. This updated technical paper takes into account the following sources of information in addition to those consulted previously:

(a) The 16 NCs, 6 BURs, 22 BTRs, 1 BUR and NC submitted as a single report, and 3 BTRs and NCs submitted as a single report submitted between 1 June 2025 and 31 May 2026;

¹ Decision [9/CP.30](#), para. 8. That decision was taken note of in decision [16/CMA.7](#). The revised terms of reference are contained in the annex to decision [9/CP.30](#).

² Decision [9/CP.30](#), annex, paras. 2(a) and 3(a).

³ In accordance with decision [1/CP.24](#), para. 43(a), Parties may submit their NC and BTR as a single report in accordance with the MPGs, as contained in the annex to decision [18/CMA.1](#), for information also covered by the NC reporting guidelines contained in, as applicable, decisions [4/CP.5](#) and [17/CP.8](#).

⁴ Decision [18/CMA.1](#), annex.

⁵ Decision [9/CP.30](#), annex, para. 4(b).

⁶ [FCCC/SBI/2025/19](#), para. 45(a).

⁷ As footnote 6 above.

⁸ Available at <https://unfccc.int/documents/645990>.

⁹ [FCCC/TP/2025/2](#).

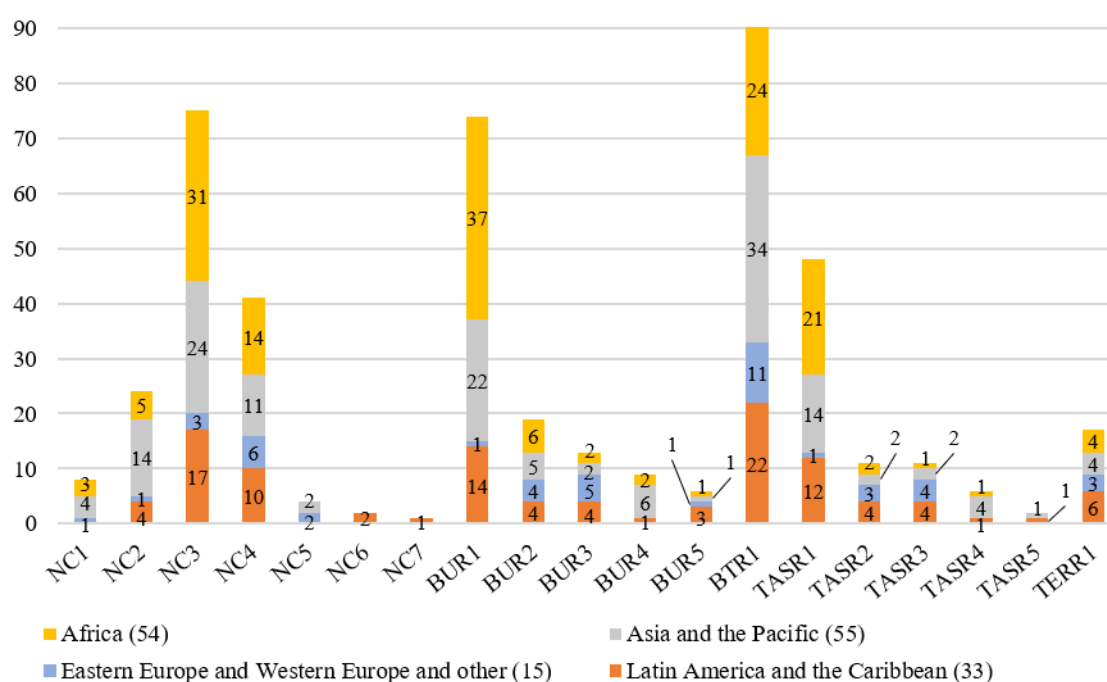
(b) The 6 summary reports on the technical analysis of a BUR and 16 reports on the technical expert review of a BTR published between 1 June 2025 and 31 May 2026.

6. This paper draws on 155 NCs, 121 BURs and 91 BTRs, which are the most recent submissions made by 157 developing country Parties or Parties not included in Annex I to the Convention as at 31 May 2026, and the 78 summary reports on the technical analysis of a BUR and 17 reports on the technical expert review of a BTR published as at the same date.

7. In effect, the challenges and needs reported in previous NCs and BURs have been superseded with information from a more recent report, if available. The reports covered in this paper range from the NC1 to the NC7, from the first to the fifth BUR, and from the first to the fifth summary report on the technical analysis of a BUR. BTR1s and the reports on the technical expert review thereof are also included in the compilation and synthesis. Figure 1 provides an overview of the reports included in the compilation and synthesis carried out for this paper, by report and region.

Figure 1

Number of most recent reports compiled and synthesized, by report and region



Note: The figures in parentheses specify the number of developing country Parties whose reports were included in the compilation and synthesis for each region.

C. Possible action by the Subsidiary Body for Implementation

8. The SBI will be invited to consider this paper and to provide guidance, as appropriate, to the CGE.

II. Approach to the compilation and synthesis

9. Between 1 June 2025 and 31 May 2026, the CGE compiled and synthesized information on the problems and constraints faced by developing country Parties and lessons learned in preparing NCs, BURs and BTRs, including the challenges and needs reported in their most recent reports and the capacity-building needs identified in the summary reports on the technical analysis of a BUR and the reports on the technical expert review of a BTR.

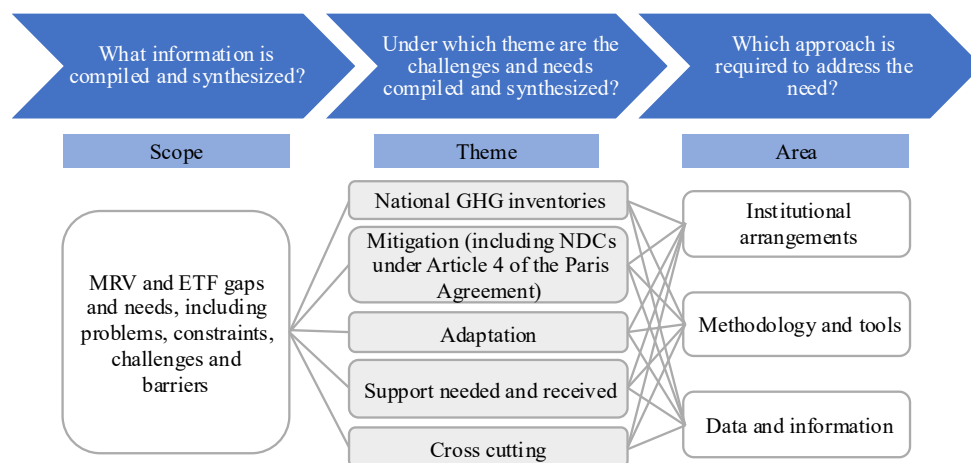
10. Developing country Parties reported challenges and needs in various ways, using terms such as “problem”, “constraint”, “gap”, “barrier”, “opportunity for improvement” and “lack of”. Given that incorporating information reported in a wide variety of ways into a

specific data structure requires a strong analytical framework, the compilation and synthesis took into account various aspects of the challenges and needs reported.¹⁰

11. Figure 2 provides an overview of the approach to the compilation and synthesis, including the scope of the process and aspects of the information examined.

Figure 2

Analytical framework for compiling and synthesizing information on the challenges and needs reported by developing country Parties



12. To examine the aspects of the challenges and needs reported (see para. 10 above), developing country Parties were considered as follows:

- (a) As a group (referred to as “global” in figures 3–5 and 7–12);
- (b) By geographical region: Africa, Asia and the Pacific, Eastern Europe and Western Europe and other, and Latin America and the Caribbean;
- (c) By taking into account the special circumstances of the LDCs and SIDS: one group consisting of the LDCs and SIDS, and one group consisting of developing country Parties that are not the LDCs or SIDS.

III. Results of the compilation and synthesis

A. Overview of challenges and needs reported by developing country Parties

13. This chapter provides an overview of the challenges and needs, captured from the reports referred to in paragraph 6 above, broken down by theme and area, with reference to the regions and developing country Party groups referred to in paragraph 12 above.

14. Figure 3 shows the number of developing country Parties, by region and globally, that reported at least one challenge or need under each theme listed in figure 2. At the global level, the most commonly reported challenges and needs related to preparing national GHG inventories (reported by 149 Parties, or 95 per cent of the Parties whose reports were analysed), followed by cross-cutting issues (143 Parties, or 91 per cent) and reporting on climate change impacts and adaptation (138 Parties, or 88 per cent).

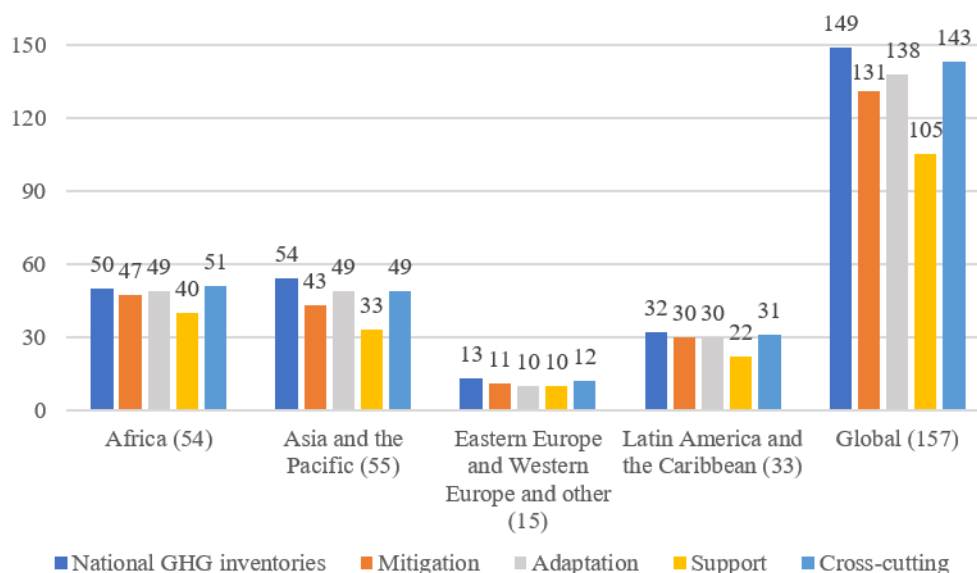
15. Figure 4 shows the thematic breakdown of the challenges and needs reported by developing country Parties, by region and globally. Although there were similar patterns in the order by frequency of the challenges and needs reported under the different themes, the share of each theme varied across the regions. Across all regions, the largest percentage of reported challenges related to preparing national GHG inventories. The next highest percentage of reported challenges for Asia and the Pacific and for Latin America and the

¹⁰ For more details, see document [FCCC/TP/2024/6](#), para. 8.

Caribbean pertained to reporting on climate change impacts and adaptation, while for Africa and for Eastern Europe and Western Europe and other, it pertained to cross-cutting issues.

Figure 3

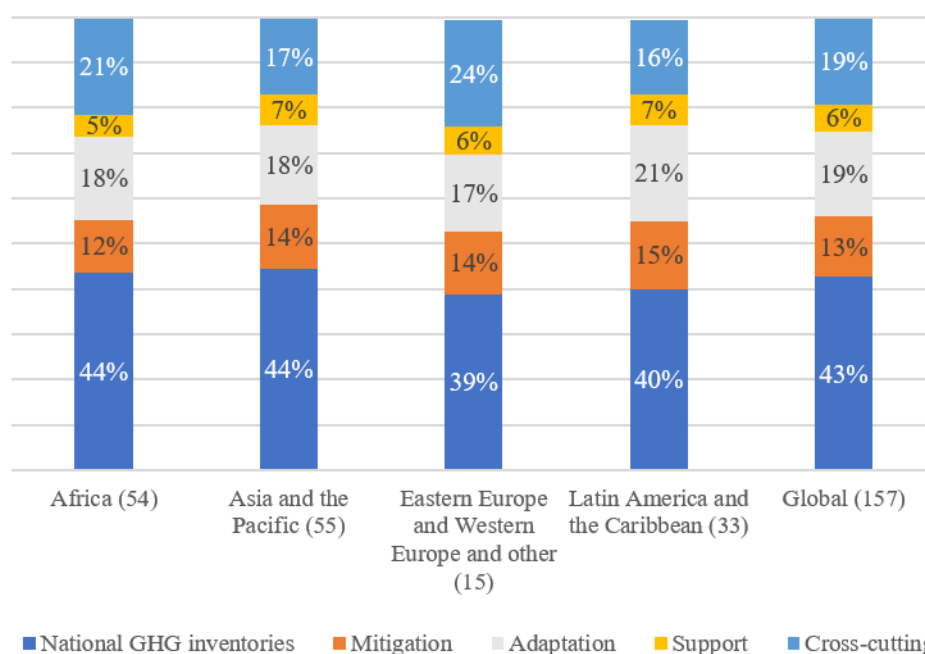
Number of developing country Parties that reported at least one challenge or need under each theme, by region and globally



Note: The figures in parentheses specify the number of developing country Parties whose reports were included in the compilation and synthesis for each region and globally.

Figure 4

Thematic breakdown of challenges and needs reported by developing country Parties, by region and globally



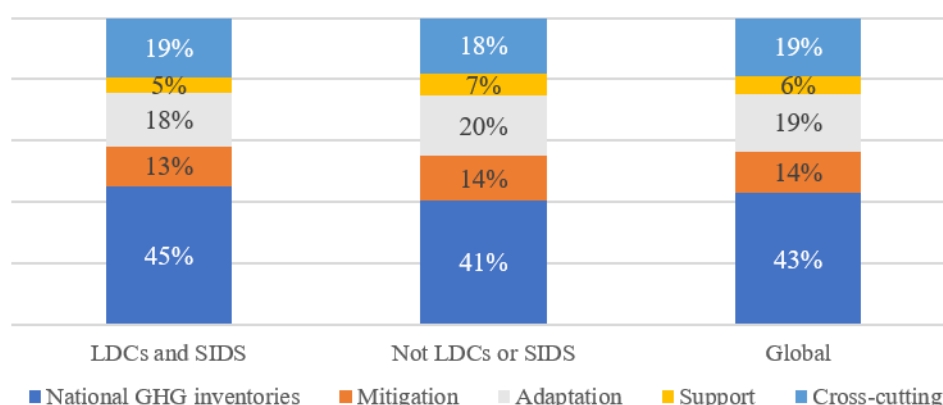
Note: The figures in parentheses specify the number of developing country Parties whose reports were included in the compilation and synthesis for each region and globally. The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded thematic-level percentages provided in the figure.

16. Figure 5 shows the thematic breakdown of the challenges and needs reported by developing country Parties, both globally and by developing country Party group. The

thematic breakdown of the challenges and needs reported by the LDCs and SIDS differs slightly from the breakdown of the challenges and needs reported by developing country Parties that are not the LDCs or SIDS. For instance, the second most frequently reported challenges and needs among the LDCs and SIDS are associated with cross-cutting issues, whereas among other developing country Parties, the second most frequently reported challenges and needs relate to adaptation.

Figure 5

Thematic breakdown of challenges and needs reported, by developing country Party group and globally

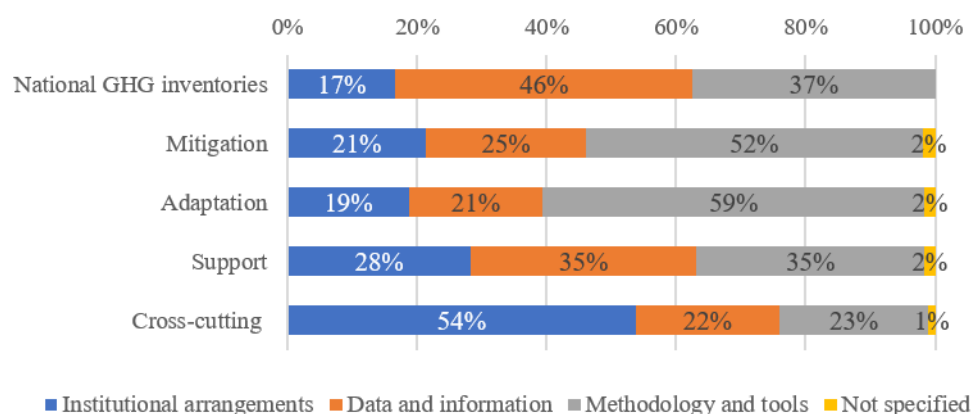


Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded thematic-level percentages provided in the figure.

17. The breakdown of areas in which challenges and needs were identified also differed by theme, as shown in figure 6. For the challenges and needs associated with preparing national GHG inventories, a significant portion (46 per cent) were in the area of data and information. For the challenges and needs associated with reporting on mitigation actions and progress in implementing NDCs and on climate change impacts and adaptation, most (52 and 59 per cent respectively) were in the area of methodology and tools. For cross-cutting challenges and needs, the majority (54 per cent) fell under the area of institutional arrangements. The challenges and needs pertaining to reporting on support needed and received were almost evenly spread across the different areas.

Figure 6

Breakdown of areas in which challenges and needs were identified, by theme



Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded area-level percentages provided in the figure.

B. Preparing national greenhouse gas inventories

18. With regard to preparing national GHG inventories, most of the challenges and needs reported related to data and information (45 per cent), followed by methodology and tools (38 per cent) and institutional arrangements (16 per cent). The three most frequently reported categories of issues were availability of quality data (20 per cent), technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training (17 per cent), and data-collection process (15 per cent). Table 1 gives a breakdown by category of the identified issues in preparing national GHG inventories.

Table 1

Categories of identified issues in preparing national greenhouse gas inventories

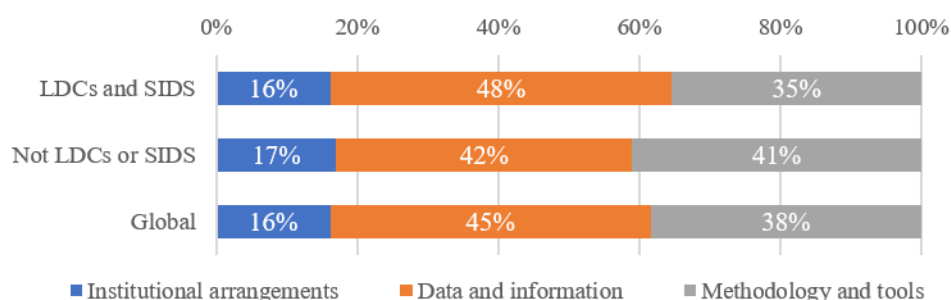
<i>Category of issue (lack thereof or insufficient), by area</i>	<i>Percentage of total reported issues under theme^a</i>
Data and information	45
Availability of quality data	20
Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform)	15
Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures)	8
Accessibility of data (owing to confidentiality issues)	1
Methodology and tools	38
Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training	17
Technical backstopping	11
Practical guidance, tools and methods	7
Technical capacity (and knowledge) for interpreting, analysing and translating data and information gathered using tools, methods, etc., including training	3
Technological infrastructure	1
Institutional arrangements	16
Institutional capacity to sustain and improve the MRV and transparency process over time	6
Coordination across sectors and institutions for collecting and sharing data	4
Policy or legal arrangements that mandate the preparation of national reports	3
Definition of roles and responsibilities across the institutions involved	1
Stakeholder awareness, especially in the private sector	1
Leadership (e.g. an entity appointed to undertake and coordinate data collection and data-sharing)	1
Total	100

^a The total and area-level percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded category-level percentages provided in the table.

19. The percentage breakdown by area of reported challenges and needs related to preparing national GHG inventories differed by developing country Party group, although there were similar patterns in the order by frequency of the reported challenges and needs in those areas. Notably, the share of challenges and needs reported in the area of data and information was 6 percentage points higher for the LDCs and SIDS (48 per cent) compared with developing country Parties that are not the LDCs or SIDS (42 per cent). Figure 7 provides a breakdown of the areas in which challenges and needs relating to preparing national GHG inventories were identified by the different groups of developing country Parties and globally. Box 1 provides examples from the categories with the three highest shares of the identified issues associated with preparing national GHG inventories.

Figure 7

Breakdown of areas in which challenges and needs relating to preparing national greenhouse gas inventories were identified, by developing country Party group and globally



Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded area-level percentages provided in the figure.

Box 1

Category-based examples of issues associated with preparing national greenhouse gas inventories

Availability of quality data: Many developing country Parties reported limited availability and poor quality of activity data as major challenges affecting the preparation of national GHG inventories. Common issues include missing or incomplete historical time series, insufficiently disaggregated or inconsistent data, poor sectoral coverage, and reliance on default values, proxy data or expert judgment. Parties emphasized that improving the availability, consistency and quality of activity data through regular data collection, standardized databases and better sectoral reporting would enable more complete inventories, reduce uncertainties and support the application of higher-tier IPCC methodologies and country-specific emission factors.

Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training: Many developing country Parties reported limited technical capacity to apply and insufficient knowledge of IPCC guidelines, methodologies, tools and software as key challenges affecting the preparation of national GHG inventories. They highlighted the need to strengthen the capacity of national experts to apply higher-tier IPCC methodologies, conduct uncertainty assessments and QA/QC procedures, and use ETF reporting tools and common reporting tables. Enhanced technical training and continuous capacity-building were emphasized as essential for improving the accuracy, consistency and transparency of national GHG inventories.

Data-collection process: Many developing country Parties reported challenges in relation to national data-collection processes that affect the preparation of national GHG inventories. Common issues include incomplete, inconsistent, outdated and insufficiently disaggregated activity data, the absence of systematic and continuous data-collection procedures, and limited availability of historical time series. Parties highlighted the lack of standardized data-collection templates, centralized databases, digital information systems and effective mechanisms for data-sharing, validation, archiving and QC across institutions. These challenges were evident in key categories, where significant data gaps and weak statistical systems reduced the accuracy, completeness, consistency and transparency of national GHG inventories.

C. Reporting on mitigation actions and progress in implementing nationally determined contributions

20. With regard to reporting on mitigation actions and progress in implementing NDCs, just over half of the challenges and needs reported related to methodology and tools (53 per cent), followed by data and information (24 per cent) and institutional arrangements (21 per cent). Challenges relating to technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training, accounted for the largest share (20 per cent) of the total reported issues under this theme, followed by challenges arising from lack of practical guidance, tools and methods (18 per cent) and challenges related to the data-collection process (11 per cent). Table 2 gives a breakdown by category of the identified issues in reporting on mitigation actions and progress in implementing NDCs.

Table 2

Categories of identified issues in reporting on mitigation actions and progress in implementing nationally determined contributions

<i>Category of issue (lack thereof or insufficient), by area</i>	<i>Percentage of total reported issues under theme^a</i>
Methodology and tools	53
Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training	20
Practical guidance, tools and methods	18
Technical capacity (and knowledge) for interpreting, analysing and translating data and information gathered using tools, methods, etc., including training	9
Technical backstopping	6
Technological infrastructure	0
Data and information	24
Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform)	11
Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures)	5
Availability of quality data	8
Accessibility of data (owing to confidentiality issues)	1
Institutional arrangements	21
Institutional capacity to sustain and improve the MRV and transparency process over time	8
Coordination across sectors and institutions for collecting and sharing data	5
Policy or legal arrangements that mandate the preparation of national reports	4
Stakeholder awareness, especially in the private sector	2
Leadership (e.g. an entity appointed to undertake and coordinate data collection and data-sharing)	1
Definition of roles and responsibilities across the institutions involved	1
Not specified	2
Total	100

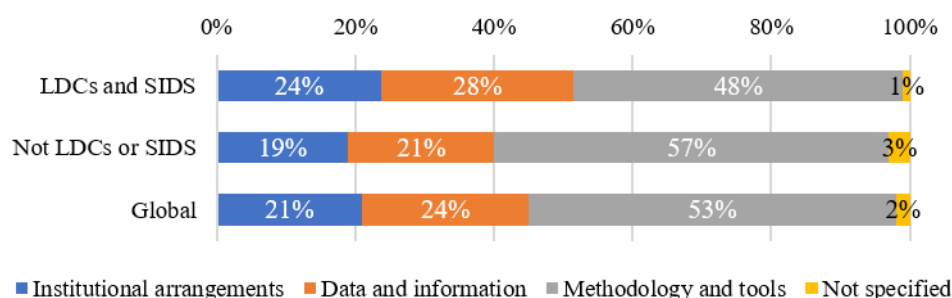
^a The total and area-level percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded category-level percentages provided in the table.

21. The percentage breakdown by area of reported challenges and needs relating to reporting on mitigation actions and progress in implementing NDCs differed by developing country Party group, although there were similar patterns in the order by frequency of the reported challenges and needs in those areas. The LDCs and SIDS reported a higher share of challenges and needs in both the area of institutional arrangements and the area of data and information (by 5 and 7 percentage points respectively) than developing country Parties that are not the LDCs or SIDS. Challenges and needs associated with the area of methodology

and tools constituted the largest share of challenges and needs reported for both groups of developing country Parties. Figure 8 provides a breakdown of the areas in which challenges and needs relating to reporting on mitigation actions and progress in implementing NDCs were identified by the different groups of developing country Parties and globally. Box 2 provides examples from the categories with the three highest shares of the identified issues associated with reporting on mitigation actions and progress in implementing NDCs.

Figure 8

Breakdown of areas in which challenges and needs relating to reporting on mitigation actions and progress in implementing nationally determined contributions were identified, by developing country Party group and globally



Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded area-level percentages provided in the figure.

Box 2

Category-based examples of issues associated with reporting on mitigation actions and progress in implementing nationally determined contributions

Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training: Many developing country Parties reported limited technical capacity and expertise to apply the mitigation assessment methodologies, analytical tools and modelling approaches for reporting on mitigation actions. Common challenges include insufficient knowledge of and experience in estimating emission reductions; assessing the impacts of policies and measures; and reporting on assumptions, methodologies, progress indicators and results of mitigation actions in accordance with the MRV arrangements and the ETF. Parties also highlighted limited capacity to use mitigation modelling tools and software, quantify mitigation impacts and co-benefits, assess costs and uncertainties associated with mitigation actions, and use common tabular formats. These capacity constraints were further compounded by shortages of trained national experts, limited experience with modelling and scenario analysis, insufficient understanding of reporting requirements across sectoral institutions, and the need for continuous training to ensure consistent application of evolving guidelines, methodologies and technical tools for mitigation assessment and reporting.

Practical guidance, tools and methods: Many developing country Parties identified limited availability of practical guidance, standardized methodologies and appropriate analytical tools as a key challenge affecting the assessment of and reporting on mitigation actions. Common challenges include the absence of practical guidance and standardized methodologies for estimating emission reductions, developing baseline and mitigation scenarios and long-term GHG emission projections, estimating emission reductions and mitigation impacts, assessing the co-benefits and costs of mitigation actions, and tracking and reporting mitigation actions consistently across sectors in accordance with ETF reporting requirements. Parties highlighted the limited availability of sector-specific methodologies, modelling platforms for scenario development and emissions projections, and reporting templates for supporting the consistent implementation of mitigation assessment and reporting.

Data-collection process: Many developing country Parties reported issues relating to data-collection processes and information management systems as major challenges affecting the monitoring of and reporting on mitigation actions. Common challenges include the absence of centralized databases and MRV systems; inconsistent, incomplete and non-standardized data collection across sectors and institutions; limited mechanisms for data-sharing, archiving and QA; and insufficient data for quantifying emission reductions. Parties emphasized the need to establish systematic and continuous data-collection processes, standardized reporting templates, interoperable information systems and centralized databases to improve the tracking, assessment and transparent reporting of mitigation actions and progress towards achieving NDCs and meeting ETF requirements.

D. Reporting on climate change impacts and adaptation

22. With regard to reporting on climate change impacts and adaptation, most challenges and needs reported related to the area of methodology and tools (60 per cent), followed by the areas of data and information (20 per cent) and institutional arrangements (19 per cent). The need for technical backstopping accounted for the largest share (18 per cent) of total reported issues under the theme, followed by the needs for practical guidance, tools and methods (16 per cent), technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training (12 per cent), and technological infrastructure (12 per cent). Notably, the top three categories of issues for this theme all fall under the area of methodology and tools. Table 3 gives a breakdown by category of the identified issues in reporting on climate change impacts and adaptation.

Table 3

Categories of identified issues in reporting on climate change impacts and adaptation

<i>Category of issue (lack thereof or insufficient), by area</i>	<i>Percentage of total reported issues under theme^a</i>
Methodology and tools	60
Technical backstopping	18
Practical guidance, tools and methods	16
Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training	12
Technological infrastructure	12
Technical capacity (and knowledge) for interpreting, analysing and translating data and information gathered using tools, methods, etc., including training	3
Data and information	20
Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform)	9
Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures)	3
Availability of quality data	8
Accessibility of data (owing to confidentiality issues)	0
Institutional arrangements	19
Institutional capacity to sustain and improve the MRV and transparency process over time	5
Coordination across sectors and institutions for collecting and sharing data	6
Policy or legal arrangements that mandate the preparation of national reports	2
Stakeholder awareness, especially in the private sector	2
Leadership (e.g. an entity appointed to undertake and coordinate data collection and data-sharing)	1
Definition of roles and responsibilities across the institutions involved	1

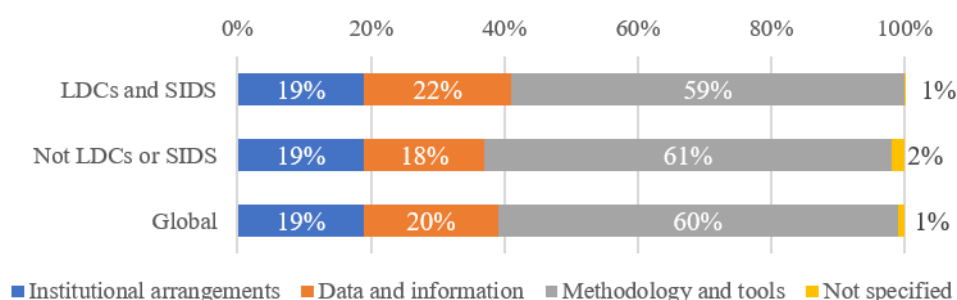
Category of issue (lack thereof or insufficient), by area	Percentage of total reported issues under theme ^a
Not specified	1
Total	100

^a The total percentages were calculated using exact (not rounded) values and may therefore differ from the rounded total percentages provided in the table.

23. The percentage breakdown by area of reported challenges and needs related to reporting on climate change impacts and adaptation differed by developing country Party group, although there were similar patterns in the order by frequency of the reported challenges and needs in those areas. The share of challenges and needs reported in the area of data and information is 4 percentage points higher among the LDCs and SIDS compared with developing country Parties that are not the LDCs or SIDS. Challenges and needs associated with the area of methodology and tools constituted the largest share of challenges and needs reported for both groups of developing country Parties. Figure 9 provides a breakdown of the areas in which challenges and needs relating to reporting on climate change impacts and adaptation were identified by the different groups of developing country Parties and globally. Box 3 provides examples from four categories with the highest shares of the identified issues associated with reporting on climate change impacts and adaptation.

Figure 9

Breakdown of areas in which challenges and needs relating to reporting on climate change impacts and adaptation were identified, by developing country Party group and globally



Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded area-level percentages provided in the figure.

Box 3

Category-based examples of issues associated with reporting on climate change impacts and adaptation

Technical backstopping: Many developing country Parties identified limited technical backstopping for adaptation-related assessments, including vulnerability and risk assessments, climate impact studies, climate modelling and scientific research, as a major challenge affecting adaptation reporting and planning. Common challenges include insufficient technical support for developing national and sectoral climate scenarios, downscaling climate projections, conducting evidence-based vulnerability assessments, establishing adaptation indicators and translating scientific information into decision-making, particularly at the subnational and sectoral level. Parties emphasized the need for sustained technical backstopping through strengthened collaboration with research institutions, specialized technical expertise and long-term support for climate observation, modelling, monitoring and applied research to improve the quality and robustness of adaptation reporting and planning.

Practical guidance, tools and methods: Many developing country Parties identified the lack of practical guidance, standardized methodologies and fit-for-purpose tools as a major challenge affecting the conduct and reporting of

adaptation assessments. Common challenges include the absence of harmonized approaches to conducting vulnerability and climate risk assessments; monitoring, evaluating and reporting on adaptation; developing adaptation indicators and metrics; developing and downscaling climate scenarios; and using modelling, mapping and decision support tools across sectors and scales. Parties emphasized the need for practical guidance, standardized methodologies, user-friendly tools and protocols, and country-specific approaches that strengthen the consistency, comparability and scientific robustness of adaptation planning, implementation, monitoring and reporting.

Technological infrastructure: Many developing country Parties identified inadequate technological infrastructure as a major challenge affecting the generation, management and reporting of adaptation information. Common challenges include insufficient and poorly distributed meteorological, hydrological and oceanographic observation networks, outdated or poorly maintained climate monitoring equipment, limited real-time data transmission and storage systems, weak early warning systems, and inadequate digital infrastructure for climate information management, modelling and reporting. Parties emphasized the need to modernize and expand observation networks, strengthen monitoring and early warning infrastructure, improve data management and communication systems, and invest in resilient technological infrastructure to support climate risk assessment and adaptation planning, implementation, monitoring and reporting.

Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training: Many developing country Parties identified limited technical capacity and insufficient knowledge for applying adaptation-related guidelines, methodologies, tools and analytical approaches as major challenges affecting adaptation assessment and reporting. Common challenges include limited expertise in conducting vulnerability and risk assessments; applying the MPGs (in relation to adaptation reporting), the PEG M&E tool and the IPCC guidelines for assessing climate change impacts and adaptations; using climate models, downscaling techniques, geographic information systems, remote sensing and modelling tools; developing climate change scenarios; conducting cost-benefit analyses for adaptation assessment; establishing monitoring and evaluation frameworks; and developing adaptation reporting methodologies, as well as the absence of standardized national methodologies for vulnerability and adaptation assessment and insufficient access to specialized training on adaptation assessment methodologies, climate modelling and reporting. Parties emphasized the needs for capacity-building programmes, technical training, methodological guidance and knowledge transfer; development of national expertise; and improved access to analytical tools and sector-specific methods to strengthen adaptation planning, implementation, monitoring and reporting.

E. Reporting on support needed and received

24. With regard to reporting on support needed and received, the challenges and needs identified were evenly spread across the different areas. The distribution was as follows: 39 per cent under methodology and tools, 35 per cent under data and information and 25 per cent under institutional arrangements. Under these areas, the need for practical guidance, tools and methods accounted for the largest share (24 per cent) of total reported issues under the theme, followed by challenges related to the data-collection process (21 per cent) and the need to develop or maintain institutional capacity to sustain and improve the MRV and transparency process over time (11 per cent). Table 4 gives a breakdown by category of the issues identified in reporting on support needed and received.

25. The percentage breakdown by area of reported challenges and needs related to reporting on support needed and received differed by developing country Party group, although there were similar patterns in the order by frequency of the reported challenges and needs in those areas. The share of challenges and needs reported in the area of institutional arrangements is 8 percentage points higher among the LDCs and SIDS compared with

developing country Parties that are not the LDCs or SIDS. Figure 10 provides a breakdown of the areas in which challenges and needs relating to reporting on support needed and received were identified by the different groups of developing country Parties and globally. Box 4 provides examples from the categories with the three highest shares of the identified issues associated with reporting on support needed and received.

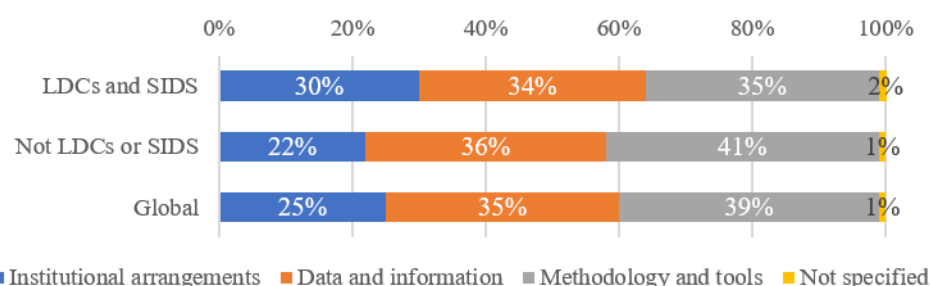
Table 4

Categories of identified issues in reporting on support needed and received

<i>Category of issue (lack thereof or insufficient), by area</i>	<i>Percentage of total reported issues under theme^a</i>
Methodology and tools	39
Practical guidance, tools and methods	24
Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training	10
Technical backstopping	4
Technical capacity (and knowledge) for interpreting, analysing and translating data and information gathered using tools, methods, etc., including training	1
Technological infrastructure	0
Data and information	35
Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform)	21
Availability of quality data	9
Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures)	5
Accessibility of data (owing to confidentiality issues)	1
Institutional arrangements	25
Institutional capacity to sustain and improve the MRV and transparency process over time	11
Coordination across sectors and institutions for collecting and sharing data	6
Policy or legal arrangements that mandate the preparation of national reports	3
Leadership (e.g. an entity appointed to undertake and coordinate data collection and data-sharing)	3
Stakeholder awareness, especially in the private sector	1
Definition of roles and responsibilities across the institutions involved	1
Not specified	1
Total	100

^a The total and area-level percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded category-level percentages provided in the table.

Figure 10

Breakdown of areas in which challenges and needs relating to reporting on support needed and received were identified, by developing country Party group and globally


Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded area-level percentages provided in the figure.

Box 4

Category-based examples of issues associated with reporting on support needed and received

Practical guidance, tools and methods: Many developing country Parties mentioned the lack of practical guidance, standardized methodologies and appropriate tools as a major challenge affecting the identification and tracking of and reporting on support needed and received. Common challenges include the absence of common definitions, taxonomies and methodologies for classifying climate finance, technology transfer and capacity-building support, estimating support needs, conducting technology needs assessments, avoiding double counting of financial, technology transfer and capacity-building support, developing indicators for tracking and reporting support needed and received, and using climate finance tracking tools, budget-tagging systems and MRV frameworks consistently with the MPGs. Parties emphasized the need for practical guidance, standardized methodologies, reporting tools and templates for tracking and reporting support needed and received, and integrated support tracking systems to improve the consistency, transparency and comparability of reporting on support needed and received.

Data-collection process: Many developing country Parties reported constraints in establishing and using data-collection and information management processes as a major challenge affecting the reporting on support needed and received. Common challenges include fragmented and decentralized data collection, the absence of centralized databases and systems for tracking financial, technology transfer and capacity-building support, inconsistent and incomplete or overlapping information across institutions and sectors, limited data on private sector and subnational support, and inadequate mechanisms for compiling, classifying, validating and archiving information on financial, technological and capacity-building support. Parties emphasized the need to establish systematic and continuous data-collection processes, integrated information management systems for tracking support needed and received, standardized reporting templates and stronger institutional coordination to improve the completeness, consistency and transparency of reporting on support needed and received.

Institutional capacity to sustain and improve the MRV and transparency process over time: Many developing country Parties reported the need to strengthen institutional arrangements and human and financial resources for sustaining and improving systems for reporting on support needed and received over time. Common challenges include the absence of permanent institutional mandates, dedicated teams and long-term funding mechanisms; weak coordination among institutions; limited capacity to mobilize and access climate finance; and reliance on project-based or donor-driven arrangements that undermine the continuity of reporting processes. Parties reported the need to strengthen institutional frameworks, establish sustainable financing and coordination mechanisms, enhance national expertise, and strengthen national systems for tracking and reporting support needed and received.

F. Cross-cutting issues

26. With respect to cross-cutting issues, most challenges and needs reported related to the area of institutional arrangements (51 per cent), followed by the areas of methodology and tools (27 per cent) and data and information (21 per cent). Challenges and needs pertaining to enhancing institutional capacity to sustain and improve the MRV and transparency process over time were most frequently reported (20 per cent), followed by those pertaining to the data-collection process (12 per cent) and coordination across sectors and institutions for collecting and sharing data (11 per cent). Table 5 summarizes the identified cross-cutting issues by category.

Table 5
Categories of identified cross-cutting issues

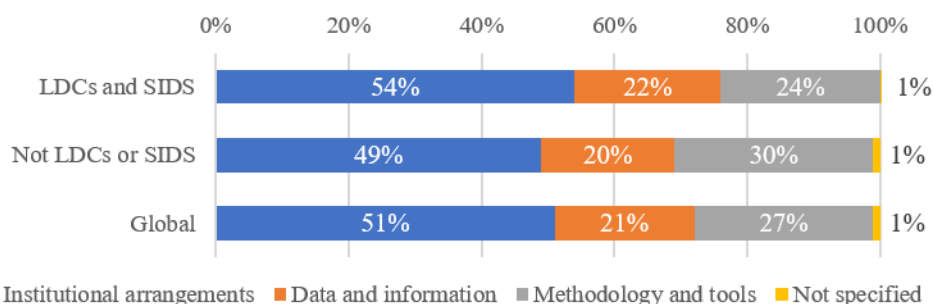
<i>Category of issue (lack thereof or insufficient), by area</i>	<i>Percentage of total reported issues under theme^a</i>
Institutional arrangements	51
Institutional capacity to sustain and improve the MRV and transparency process over time	20
Coordination across sectors and institutions for collecting and sharing data	11
Policy or legal arrangements that mandate the preparation of national reports	8
Stakeholder awareness, especially in the private sector	6
Leadership (e.g. an entity appointed to undertake and coordinate data collection and data-sharing)	4
Definition of roles and responsibilities across the institutions involved	3
Methodology and tools	27
Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training	10
Practical guidance, tools and methods	7
Technical backstopping	5
Technical capacity (and knowledge) for interpreting, analysing and translating data and information gathered using tools, methods, etc., including training	3
Technological infrastructure	2
Data and information	21
Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform)	12
Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures)	5
Availability of quality data	3
Accessibility of data (owing to confidentiality issues)	0
Not specified	1
Total	100

^a The total and area-level percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded category-level percentages provided in the table.

27. The percentage breakdown by area of cross-cutting challenges and needs differed by developing country Party group, although there were similar patterns in the order by frequency of the reported challenges and needs in those areas. The share of challenges and needs in the area of institutional arrangements is 5 percentage points higher among the LDCs and SIDS compared with developing country Parties that are not the LDCs or SIDS. Figure 11 provides a breakdown of the areas in which challenges and needs relating to cross-cutting issues were identified by the different groups of developing country Parties and globally. Box 5 provides examples from the three categories with the highest shares of the identified cross-cutting issues.

Figure 11

Breakdown of areas in which challenges and needs relating to cross-cutting issues were identified, by developing country Party group and globally



Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded area-level percentages provided in the figure.

Box 5

Category-based examples of cross-cutting issues

Institutional capacity to sustain and improve the MRV and transparency process over time: Many developing country Parties reported constraints in establishing institutional arrangements and insufficient institutional capacity for sustaining and improving national MRV and transparency systems over time. Common challenges include the absence of permanent institutional frameworks, dedicated technical teams and long-term funding, high staff turnover, dependence on project-based and external support, weak coordination among institutions, and inadequate mechanisms for facilitating knowledge management, institutional memory and continuous reporting. Parties emphasized the need to institutionalize national transparency systems, strengthen permanent institutional arrangements and inter-institutional coordination, secure sustainable financial and human resources, and establish mechanisms that support continuous capacity-building and knowledge transfer.

Data-collection process: Many developing country Parties expressed the need to strengthen data-collection and information management processes in all areas of climate reporting. Common challenges include fragmented and non-standardized data-collection procedures, the absence of centralized databases and information systems, limited data management, archiving and QC, inadequate documentation of methodologies and data sources, and weak digital platforms for collecting, processing and sharing information across institutions. Parties emphasized the need to establish standardized and continuous data-collection processes, centralized climate information systems and MRV platforms, harmonized reporting templates with MPGs, robust data management and archiving systems, and digital tools to improve the consistency, accessibility and quality of reporting.

Coordination across sectors and institutions for collecting and sharing data: Many developing country Parties identified the need to strengthen coordination across sectors and institutions for collecting, managing and sharing data for climate reporting. Common challenges include fragmented institutional arrangements for collecting and sharing data, unclear roles and responsibilities of stakeholders, limited engagement of sectoral ministries, subnational governments, academia, the private sector and other stakeholders in data collection and reporting processes, weak information-sharing mechanisms, the absence of formal agreements and standardized protocols for data exchange, and poor interoperability of data systems, resulting in inconsistent, delayed and incomplete reporting. Parties emphasized the need to establish formal institutional arrangements, strengthen inter-institutional coordination and stakeholder engagement, develop standardized data-sharing protocols and centralized

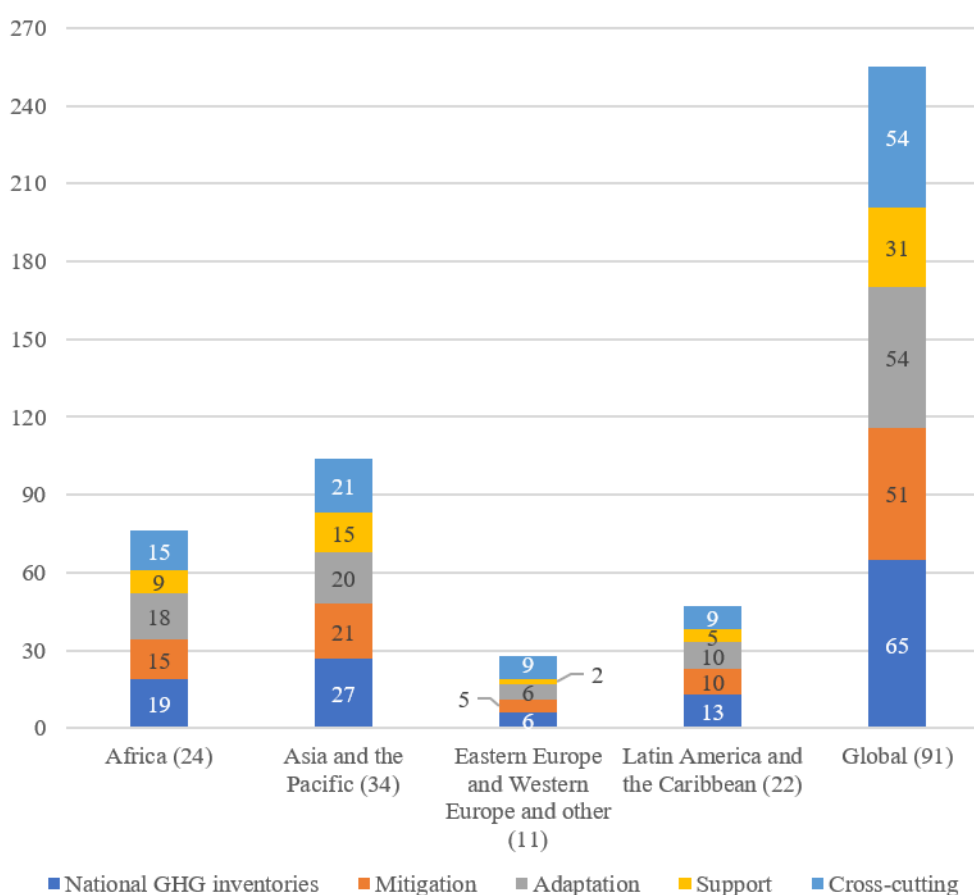
information systems, and improve collaboration across all levels of government and relevant stakeholders to facilitate climate action and reporting at the systemic level.

G. Examining the challenges and needs reported in biennial transparency reports

28. This chapter illustrates the needs and challenges reported in the BTR1 submissions alone. Figure 12 shows the number of developing country Parties, by region and globally, that reported in their BTR1s at least one challenge or need under each theme.

Figure 12

Number of developing country Parties that reported, in their first biennial transparency report, at least one challenge or need under each theme, by region and globally



Note: The figures in parentheses specify the number of developing country Parties whose reports were included for each region and globally.

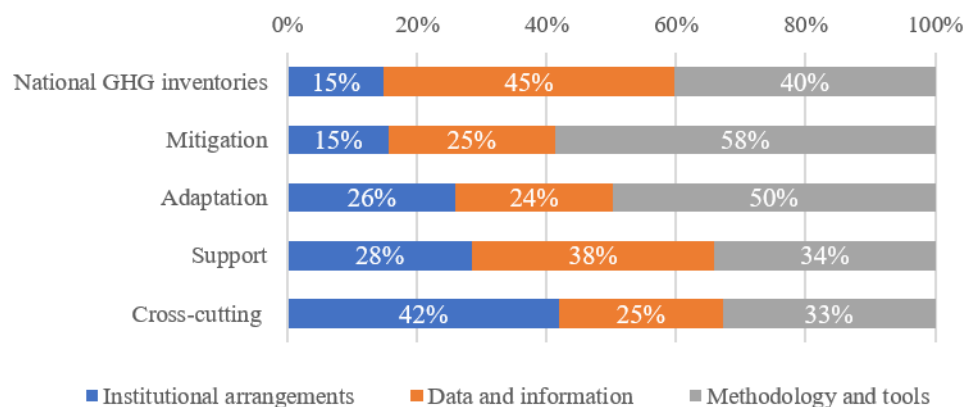
29. At the global level, the most commonly reported challenges and needs among Parties related to preparing national GHG inventories (reported by 65 Parties, or 71 per cent of the 91 Parties that submitted BTR1s), followed by reporting on climate change impacts and adaptation, and cross-cutting issues (each theme reported by 54 Parties, or 59 per cent).

30. The breakdown of areas in which challenges and needs were identified in the BTR1s differed by theme, as shown in figure 13. Challenges and needs in the area of methodology and tools were most commonly associated with reporting on mitigation actions and progress in implementing NDCs (58 per cent) and reporting on climate change impacts and adaptation (50 per cent). For cross-cutting challenges and needs, the largest share (42 per cent) was associated with the area of institutional arrangements, and for challenges and needs

pertaining to reporting on support needed and received the largest share (38 per cent) was associated with data and information.

Figure 13

Breakdown of areas in which challenges and needs were identified by developing country Parties in their first biennial transparency reports, by theme



Note: The total percentages were calculated using exact (not rounded) values and may therefore differ from the total percentages calculated with the rounded area-level percentages provided in the figure.

H. Summary

31. Table 6 summarizes the two most frequently reported categories of issues identified in each area under each theme, as shown in tables 1–5. Areas and categories within each theme are listed in decreasing order of percentage.

Table 6

Two most frequently reported categories of issues identified by developing country Parties in each area under each theme

Theme	Category of issue (lack thereof or insufficient), by area
Preparing national GHG inventories	Data and information
	Availability of quality data
	Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform)
	Methodology and tools
	Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training
	Technical backstopping
	Institutional arrangements
	Institutional capacity to sustain and improve the MRV and transparency process over time
	Coordination across sectors and institutions for collecting and sharing data
Reporting on mitigation actions and progress in implementing NDCs	Methodology and tools
	Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training
	Practical guidance, tools and methods
	Data and information
	Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform)

<i>Theme</i>	<i>Category of issue (lack thereof or insufficient), by area</i>
	Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures) Institutional arrangements Institutional capacity to sustain and improve the MRV and transparency process over time Coordination across sectors and institutions for collecting and sharing data
Reporting on climate change impacts and adaptation	Methodology and tools Technical backstopping Practical guidance, tools and methods Data and information Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform) Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures) Institutional arrangements Institutional capacity to sustain and improve the MRV and transparency process over time Coordination across sectors and institutions for collecting and sharing data
Reporting on support needed and received	Methodology and tools Practical guidance, tools and methods Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training Data and information Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform) Availability of quality data Institutional arrangements Institutional capacity to sustain and improve the MRV and transparency process over time Coordination across sectors and institutions for collecting and sharing data
Cross-cutting issues	Institutional arrangements Institutional capacity to sustain and improve the MRV and transparency process over time Coordination across sectors and institutions for collecting and sharing data Methodology and tools Technical capacity (and knowledge) for applying guidelines, guidance, tools and methods, including training Practical guidance, tools and methods Data and information Data-collection process (including establishment of a database, data-sharing system and web-based knowledge management platform) Data management process (including documentation, archiving, QA/QC protocols and uncertainty management procedures)