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Matters relating to capacity-building

Implementation of the framework for capacity-building in developing countries

Synthesis report by the secretariat

Summary

This synthesis report has been prepared to support the Subsidiary Body for Implementation in its annual monitoring and evaluation, in accordance with decisions 2/CP.7 and 29/CMP.1, of the implementation of the framework for capacity-building in developing countries established under decision 2/CP.7. It draws on information from national communications, biennial update reports, national adaptation plans and the 2024 report of the Executive Board of the clean development mechanism to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol. The information contained in this report, presented consistently with the 15 priority areas for capacity-building in developing countries set out in the annex to decision 2/CP.7, may assist in reviewing progress in the implementation of the capacity-building framework and identifying areas where additional capacity-building support is required. Further, the report contains information on emerging or new areas for capacity-building identified in the national reports considered.

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
Article 6.4 mechanism	mechanism established by Article 6, paragraph 4, of the Paris Agreement
BUR	biennial update report
CBIT–GSP	joint programme of the Capacity-building Initiative for Transparency and the Global Support Programme for Preparation of National Communications and Biennial Update Reports by non-Annex I Parties
CDM	clean development mechanism
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
ETF	enhanced transparency framework under the Paris Agreement
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
MRV	measurement, reporting and verification
NAP	national adaptation plan
NC	national communication
NDC	nationally determined contribution
PCCB	Paris Committee on Capacity-building
QA/QC	quality assurance/quality control
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)

I. Introduction

A. Mandate

1. The Conference of the Parties requested the secretariat to produce annually a synthesis report on activities undertaken to implement the framework for capacity-building in developing countries established under decision 2/CP.7.[1]

2. The Conference of the Parties also requested the secretariat to make the report available to the Subsidiary Body for Implementation at its sessions coinciding with the annual Durban Forum on capacity-building to facilitate discussions at the Forum.[2] In addition, it decided that the report will serve as input to the work of the PCCB.[3]

3. The CMP requested the secretariat to consider in the annual synthesis report capacity-building activities related to the implementation of the Kyoto Protocol in developing countries.[4]

B. Scope

4. This report summarizes information on the extent of the implementation of the capacity-building framework, thus enabling annual monitoring of progress and identification of areas where additional capacity-building support is required.

5. The report contains information that can be used by the PCCB in undertaking its work. The 2025 focus area of the PCCB is capacity-building for holistic investment strategies, bankable projects and stakeholder engagement to strengthen the implementation of NDCs and NAPs in developing countries.

6. The information in this report relates to activities reported between March and December 2024 in 17 NCs,[5] 8 NAPs[6] and 18 BURs submitted by non-Annex I Parties.[7] The information relevant to the Kyoto Protocol comes from the CDM-related sections of those national reports and the 2024 report of the CDM Executive Board to the CMP.[8] Owing to the commencement of reporting under the ETF, there were no reports from Parties in Annex II to the Convention to consider in preparing this synthesis report, as biennial transparency reports fall outside its scope.

7. This report is limited in scope to reporting under the Convention in the context of the 15 priority areas of the capacity-building framework.[9] The evolving transparency arrangements under the UNFCCC, particularly the adoption of new reporting instruments under the Paris Agreement, including the biennial transparency report, may continue to limit the scope of these annual synthesis reports in the future.

8. Reporting on capacity-building remains a challenge, and the information provided by Parties in their national reports varies in terms of structure, scope, time frame and granularity. For example, while some Parties reported more generally on the types of capacity-building undertaken, others provided a list of capacity-building support received. Further, some Parties did not refer to the capacity-building framework in their national reports or indicate whether and which capacity-building activities fall within its scope, making it difficult to obtain a comprehensive overview of capacity-building under the Convention, track collective progress of implementation of the framework and compare information across sectors, regions and periods.

[1] Decisions 2/CP.7, para. 9(c), and 4/CP.12, para. 1(c).
[2] Decision 1/CP.18, para. 78.
[3] Decision 1/CP.21, para. 79.
[4] Decisions 29/CMP.1, para. 4, and 6/CMP.2, para. 1(c).
[5] Available at https://unfccc.int/non-annex-I-NCs.
[6] Available at https://napcentral.org/submitted-naps.
[7] Available at https://unfccc.int/BURs.
[8] FCCC/KP/CMP/2024/3.
[9] As per decision 2/CP.7, annex, para. 15.

9. A summary highlighting the main findings from the synthesized information is followed by chapters on:

(a) Capacity-building undertaken and gaps and needs identified by developing country Parties within the scope of the 15 priority areas of the capacity-building framework (see chap. III below);

(b) Emerging or new areas for capacity-building identified by developing country Parties (see chap. IV below);

(c) Capacity-building support received, to address the gaps and needs identified within the scope of the capacity-building framework (see chap. V below);

(d) Capacity-building activities under the Kyoto Protocol (see chap. VI below).

C. Possible action by the Subsidiary Body for Implementation

10. The Subsidiary Body for Implementation may wish to use the information in this report:

(a) In monitoring and reviewing the implementation of the capacity-building framework;

(b) In considering how to enhance reporting on the impacts of capacity-building activities, as well as best practices and lessons learned and how they could inform processes under the Convention in order to enhance the implementation of capacity-building activities;[10]

(c) As input to discussions at the 14th Durban Forum on capacity-building and the 9th meeting of the PCCB.

D. Possible action by the Paris Committee on Capacity-building

11. The PCCB may wish to use the information in this report for:

(a) Enhancing coherence and coordination of capacity-building under the Convention with a focus on avoiding duplication of efforts, including through collaboration with bodies under and outside the Convention that engage in activities related to capacity-building, as appropriate and in accordance with their respective mandates;

(b) Identifying capacity gaps and needs, both current and emerging, and recommending ways to address them;

(c) Promoting awareness-raising, knowledge- and information-sharing and stakeholder engagement with bodies and relevant actors under and outside the Convention, as appropriate and in accordance with their respective mandates.

II. Summary of main findings

12. Capacity-building in developing countries is progressing at the institutional, systemic and individual level. Parties have made significant progress in establishing and strengthening national policies and government entities aimed at guiding climate action in line with emerging developments and needs, with climate change considerations being mainstreamed across entities and policy areas. Technical expertise in adaptation, mitigation and cross-cutting issues is growing, and many Parties have assessed their vulnerabilities, adaptation and mitigation options, and technology needs and identified priorities for action. Climate literacy among key stakeholders and the general public is also being strengthened.

13. In terms of modalities for capacity-building, Parties highlighted training, workshops, conferences, tools, knowledge products, pilot and demonstration projects, educational initiatives, technology platforms for sharing climate information, expert forums and

[10] As per decision 16/CP.22, para. 3.

networks, and awareness-raising campaigns. In addition, Parties described activities under the UNFCCC that contribute indirectly to capacity-building, such as those that support the preparation of national reports.

14. Emerging capacity-building needs under the Paris Agreement have become increasingly prominent in Parties' reports, particularly in relation to the ETF and, to a lesser extent, new carbon markets and mechanisms. An additional area of growing relevance, particularly in African countries, is facilitating just transitions. More broadly, Parties most frequently reported requiring support for compiling GHG inventories and reporting; addressing cross-cutting issues such as strengthening institutional and technical capacities for planning, monitoring, implementing and evaluating progress of climate action; and generating and accessing high-quality data. Parties reported that their efforts to address climate change are frequently hindered by lack of financial and technical resources and insufficient knowledge and emphasized the need for capacity-building to go hand in hand with climate finance and technology transfer.

15. Parties emphasized the need for more inclusive climate action, noting that progress in this area to date has varied according to national circumstances and social norms. Parties provided examples of building capacity and taking action to facilitate the mainstreaming of gender considerations in climate action, including developing, monitoring and reviewing national climate change plans in terms of gender-responsiveness, conducting research on the differentiated impacts of climate change on women and men, providing targeted training for female delegates participating in international climate change negotiations and implementing gender-responsive adaptation and mitigation actions. Some Parties reported on improvements regarding the inclusion of Indigenous and traditional knowledge in climate planning and action; however, a need was also noted for better integration of the perspectives of marginalized groups therein, including persons with disabilities, the elderly and migrant communities. Further, some Parties reported on improvements regarding the inclusion of Indigenous and traditional knowledge in climate planning and action.

III. Implementation of the capacity-building framework

A. Institutional capacity-building, including strengthening or establishing, as appropriate, national climate change secretariats or national focal points

16. Parties reported measures undertaken for enhancing institutional capacity, such as:

(a) Establishing institutions, departments and units to improve coordination, policy development and implementation of climate-related efforts, and research on the overall effectiveness of national climate action, as well as to facilitate national and international engagement in climate governance;

(b) Strengthening existing institutions, departments and units, including by adjusting their composition, function and mandates to meet current needs, ensuring they are allocated an appropriate budget, establishing and implementing MRV systems (e.g. for GHG emissions, tracking the effectiveness of adaptation and mitigation measures, and finance, technology and capacity-building support received), streamlining data management and enhancing related tools, defining clear roles and responsibilities for key stakeholders responsible for climate governance and NDC implementation, and appointing thematic focal points;

(c) Strengthening climate-related expertise through training programmes, workshops and capacity-building initiatives, and ensuring the retention of this expertise by institutionalizing technical expert teams;

(d) Establishing institutional arrangements to enhance climate reporting, including by improving coordination between government agencies, designating clear roles and responsibilities to all actors involved in the reporting cycle, creating technical working

groups, collecting data necessary to support comprehensive and accurate climate reporting, developing archiving systems and enabling effective stakeholder engagement;

(e) Strengthening climate action at the subnational level by, inter alia, establishing local-level climate change units to facilitate locally driven climate action planning and to take into account Indigenous and local knowledge, and enhancing local participation in and ownership of climate initiatives through community engagement programmes, ensuring that climate action is inclusive and sustainable;

(f) Facilitating the engagement of a wide range of stakeholders, including from academia, civil society and the private sector, in climate-related processes by promoting their participation in committees and working groups, and taking into consideration the key role of such stakeholders in raising awareness of and implementing climate action;

(g) Implementing measures to enhance the participation and inclusion of women, youth and persons with disabilities in developing and implementing NDCs, NAPs and other climate policies, for example establishing a youth climate council to provide input on national climate strategies and policy proposals;

(h) Digitalizing administrative processes to simplify management of, encourage public engagement of, and facilitate and strengthen implementation of climate action at the national level.

17. Parties described needs for institutional capacity-building in relation to:

(a) Strengthening institutional and inter-agency arrangements for coordination of climate action and data collection by implementing robust MRV systems across all sectors and government levels and establishing a centralized, publicly accessible climate data repository to avoid inefficiencies and duplication of efforts;

(b) Enhancing awareness, fostering active engagement and promoting accountability across all institutions involved in climate action.

B. Enhancement and/or creation of an enabling environment

18. Parties reported arrangements that contribute to an enabling environment for climate action, including:

(a) Conducting systematic reviews of existing legislation and policies relating to climate action, including repealing outdated frameworks that may impact implementation of or hinder national climate efforts; and drafting new climate legislation;

(b) Initiating and institutionalizing the integration of climate change considerations into national development plans, budgets and sector-specific policies;

(c) Operationalizing a wide range of public and private finance mechanisms, such as taxation, grants and loans, to improve access to climate finance, and strengthening capacity to prepare funding proposals to submit to international finance mechanisms, such as the GCF and the GEF;

(d) Integrating gender considerations into policymaking and promoting a more equitable process of formulating and implementing climate plans, policies and actions;

(e) Promoting a climate-literate and resilient workforce by strengthening education and knowledge systems, such as by including the topic of climate change in university and technical training programmes, through providing specialized training for educators and professionals in all fields, and through investing in climate-related research institutions aimed at developing expertise, innovative solutions and leadership skills for climate governance;

(f) Increasing access to climate data and information, for example through interactive national platforms.

19. Parties described capacity-building needs for enhancing enabling environments for climate action, including:

(a) Strengthening coordination of climate change efforts across the national and subnational level, including by developing new medium- and long-term strategies;

(b) Enhancing political commitment to prioritize environmental issues by integrating the climate rationale into policy discussions, ensuring that climate considerations are consistently addressed in decision-making processes across all sectors;

(c) Ensuring coherence of adaptation and mitigation policies and measures across nationally appropriate mitigation actions, NDCs, national adaptation programmes of action and the Sustainable Development Goals;

(d) Institutionalizing monitoring and evaluation of climate action, including to systematically capture best practices and lessons learned;

(e) Strengthening monitoring of climate-related financial flows, for example by establishing a public expenditure review framework across government institutions at all levels to enable the disaggregation of budgetary flows and allocations, ensuring more efficient and direct allocation of funding to key sectors and stakeholders.

C. National communications

20. Parties highlighted that establishing institutional, legal, and financial climate change mechanisms and arrangements helps to ensure the continuity and quality of national reports (NCs, BURs, etc.), as well as continuously improve the preparation and submission thereof. Parties also emphasized that sufficient financial and technical resources are needed for collecting and verifying the data needed for national reports.

21. Parties reported that the preparation of NCs and BURs contributes to building capacity of staff at departments and ministries at the national level in the following areas: GHG inventory compilation; identifying data gaps, institutional barriers and issues affecting transparency, accuracy, consistency, completeness and comparability; assessing key sectors for vulnerability and mitigation options; and identifying needs related to finance, technology transfer and capacity-building. The preparation of NCs was mentioned as providing an opportunity to take stock of improvements made between reporting cycles.

22. Parties reported that capacity for preparing national reports has been enhanced through, inter alia, the use of data-collection tools for compiling GHG inventories and tracking adaptation and mitigation actions, as well as support needed and received; training on performing key category analyses and undertaking QA/QC procedures in accordance with IPCC guidelines; and web portals aimed at facilitating transparent reporting.

23. Parties described recurrent gaps affecting reporting under the UNFCCC, including incomplete data due to inconsistent collection and archiving, issues with data verification and lack of suitable databases. Some Parties also emphasized that their dependence on external consultants poses challenges to effectively coordinating their national climate reporting processes under the UNFCCC, as it limits the development of in-house expertise and institutional memory, thereby undermining the long-term sustainability and ownership of the reporting process.

D. National climate change programmes

24. Parties mentioned several national climate change programmes that outline priorities for facilitating the implementation of climate action and include capacity-building components. Examples are a national climate action plan with measures for strengthening awareness of waste pollution among children; an adaptation programme and action plan setting out training and research opportunities on the topics of vulnerability and adaptation; and an environmental sector strategy promoting gender equality and non-discrimination, to ensure that policies, programmes and decision-making processes are inclusive, equitable and responsive to the diverse needs and rights of all individuals. Some Parties highlighted the importance of a balanced approach to capacity-building in terms of different types of action,

ensuring that mitigation, adaptation, awareness-raising, and education and research are sufficiently covered.

25. Several Parties highlighted that formulating, monitoring and implementing such programmes is often contingent on financial support, for example from the GEF, in addition to strong institutional capacity and technical expertise.

E. Greenhouse gas inventories, emission database management and systems for collecting, managing and utilizing activity data and emission factors

26. Parties provided examples of implemented capacity-building for preparing GHG inventories and establishing sustainable inventory management systems:

(a) Conducting global, regional and country-specific training sessions and workshops for technical staff directly involved in compiling GHG inventories, as well as other stakeholders, on topics such as using the 2006 IPCC Guidelines[11] and IPCC software, GHG inventory preparation and management, data-collection methods, and QA/QC procedures;

(b) Promoting the development of and applying scalable MRV systems for estimating emissions, supported by enhanced legal and institutional frameworks; strengthening the overall transparency and effectiveness of GHG inventory systems; and supporting improved adherence to the provisions outlined under the ETF;

(c) Deploying tools and databases, such as GHG information management systems, to improve the coordination, collection and compilation of GHG inventory data by ministries, statistical agencies, industry sector stakeholders and non-State actors at all levels with a view to improving data management; and enhancing the technical capacity of data providers to develop robust systems that convert climate data into actionable insights for policymakers.

27. Parties highlighted constraints in preparing GHG inventories, including lack of adequate data and archiving systems and limited understanding of GHG inventory methodologies and national GHG-emitting activities, thereby hindering the completeness of their inventories.

28. For preparing and improving their GHG inventories, Parties reported needs for capacity-building for:

(a) Institutional strengthening and internal cooperation, in particular establishing appropriate institutional, procedural and legal arrangements and documentation for preparing national GHG inventories, with permanent, dedicated inventory compilation teams across sectors to replace the need for external technical support;

(b) Further developing the capacity and technical know-how of national inventory experts in relation to using the 2006 IPCC Guidelines and reporting tools, conducting uncertainty analysis, emission estimation and data collection, and improving the availability of training materials available in different languages;

(c) Improving data collection and management, namely by further building staff capacity; strengthening data collection across agencies and sectors; standardizing reporting formats; establishing a consolidated, accessible and non-duplicative database to support efficient data storage and sharing; establishing procedures for QA/QC and archiving, as well as for including estimates of indirect emissions in GHG inventories and generating sector-specific data; and enhancing data disclosure from the private sector, such as information on manufacturing processes;

[11] IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

(d) Enhancing the accuracy of GHG inventories, for example by improving time-series consistency, developing country-specific emission factors, activity data and parameters for all sectors and establishing guidelines, standards and core performance measurement indicators for developing baselines or emission reference levels to support tracking and reporting of the progress of mitigation actions;

(e) Improving access to climate funds to support travel for data collection, expert consultations and the development of monitoring infrastructure.

F. Vulnerability and adaptation assessment

29. Many Parties described measures undertaken to build capacity for vulnerability and adaptation assessments, including:

(a) Institutional strengthening by improving data-collection systems, refining vulnerability tracking mechanisms and establishing expert working groups for sectoral data management and technical advice;

(b) Empowering local government agencies to conduct vulnerability and adaptation assessments by training staff, establishing local steering committees and supporting integration of climate action into local policies;

(c) Developing and deploying tools for conducting context-specific vulnerability and adaptation assessments and online national data platforms on the vulnerability and readiness of specific sectors or regions;

(d) Strengthening the capacity of universities and research institutions to conduct vulnerability and adaptation assessments by providing technical training to researchers and academics in climate modelling, climate projections and downscaling techniques, as well as in the application of these tools for conducting sector-specific vulnerability and adaptation assessments;

(e) Building the capacity of institutions at the national and local level to conduct sector- and city-level vulnerability and adaptation assessments, for example by providing training on using geographic information systems for the energy sector to assess the climate vulnerabilities of their operations and assets; creating a checklist to assess the vulnerability and resilience of the health sector; holding workshops for stakeholders engaged in disaster risk reduction on using national multi-hazard platforms and early warning systems; and developing capacity-building programmes for assessing climate vulnerabilities in relation to water resources, sea level rise, sea surface temperature and saltwater intrusion.

30. Some Parties reported lack of capacity for conducting vulnerability and adaptation assessments in all key sectors and achieving the level of granularity and detail needed to adequately understand the impacts of climate change on specific regions, ecosystems and communities. Further, challenges remain in collecting consistent data, particularly for remote and resource-scarce areas, and in integrating projected climate data into vulnerability and adaptation assessments owing to limited expertise. Some Parties highlighted the need to improve coordination of early warning systems between different levels of government and strengthen information-sharing among research institutions, the private sector, community organizations and neighbouring countries.

G. Capacity-building for implementation of adaptation measures

31. Parties described a wide range of implemented measures for building capacity for adaptation, including:

(a) Developing strategies and policy frameworks, such as national adaptation strategies, NAPs and local adaptation action plans, to identify short-term priority activities, support medium- to long-term planning, guide adaptation efforts and integrate adaptation considerations into national development planning, sectoral policies and local governance;

(b) Providing training in climate adaptation planning to individuals and institutions at the national and subnational level, while supporting the mainstreaming and implementation of policies and practices in vulnerable sectors, with an emphasis on participatory processes and trade-off analysis;

(c) Enhancing the capacity of stakeholders in the financial services sector to develop and offer climate-compatible financial instruments that support adaptation action and effective risk management and transfer (such as green deposits, priority sector lending and green bonds); providing low-interest loans and tailored insurance products for farmers and entrepreneurs in the agriculture sector; and enhancing the absorptive capacity of climate finance by accrediting local banks as GCF national direct access entities;

(d) Raising awareness of climate-related risks, adaptation options and how to build resilience, including by integrating climate education into national curricula, providing targeted stakeholder training, implementing public awareness campaigns (e.g. on conserving water) and expanding financial literacy programmes to help communities learn how to manage climate-related risk;

(e) Enhancing adaptation planning by considering Indigenous and traditional knowledge alongside modern science with a view to developing adaptive solutions that are culturally relevant and environmentally sustainable, and by conducting technology needs assessments across various sectors with a view to identifying technology gaps and prioritizing the identification of solutions.

32. Parties reported examples of capacity-building support provided for implementing the following adaptation actions in the following sectors:

(a) Marine ecosystems and fisheries: providing grants and retraining programmes to enable diversification of livelihoods, promoting consumption of invasive species within to preserve biodiversity, strengthening institutional and legal capacity for coastal management, providing training on artificial reef management, providing Light Detection and Ranging training for technical staff within physical planning departments and holding online courses on water quality testing;

(b) Agriculture: establishing information-sharing mechanisms to support farmers' efforts to reduce loss and damage, establishing demonstration plots to showcase practical techniques for controlling soil erosion, and providing training on soil conservation techniques by developing training programmes for farmers on irrigation and holding community-based mangrove restoration workshops;

(c) Settlements: developing policies that include land-swap options for residents living in high-risk coastal areas;

(d) Disaster risk reduction: organizing events to promote social entrepreneurship for disaster risk reduction, bridging science, technology and innovation;

(e) Energy: diversifying energy supply sources and enhancing energy efficiency;

(f) Waste: building capacity for implementing integrated solid waste and sewage management, exploring the use of waste-to-energy technologies and landfill-based biogas production and promoting circular economy principles;

(g) Forestry: reducing deforestation and forest degradation through awareness-raising programmes and reforestation initiatives;

(h) Health: drafting protocols for responding to climate disasters, conducting research on levels of air pollution and piloting 'farm to fork' school meal programmes to improve nutrition among children.

33. Parties identified capacity-building needs in this area, including:

(a) Strengthening systems for the implementation, monitoring and evaluation of adaptation actions; improving access to reliable, centralized and up-to-date data to inform adaptation planning; enhancing the capacity to identify and implement appropriate NDC strategies and to track adaptation finance needs and flows; and developing indicators and

establishing baselines for monitoring and evaluating NAPs, with particular attention to health, education, economic opportunities, political participation and human security;

(b) Sector-specific training, including on using climate-resilient technologies;

(c) Enhancing the financial sustainability and scalability of adaptation projects by improving access to diverse funding sources, optimizing resource allocation and strengthening the capacity to draft high-quality proposals to attract climate funding;

(d) Improving cross-sectoral coordination to ensure that adaptation is effectively mainstreamed across all government levels;

(e) Making approaches to adaptation more inclusive by including gender considerations, promoting the participation of women in sustainable agriculture, introducing microcredential programmes on climate change for women in rural areas and reinforcing disability inclusion in adaptation and disaster risk reduction management work, as well as in government and donor policies;

(f) Enhancing South–South cooperation to foster knowledge transfer, strengthen climate resilience and facilitate the sharing of best practices and technologies relevant to common adaptation challenges;

(g) Increasing the uptake of digital technology by Indigenous Peoples, local communities and other vulnerable groups to increase climate resilience through enhanced engagement.

H. Assessment for implementation of mitigation options

34. With regard to capacity-building undertaken for assessing the implementation of mitigation options, some Parties highlighted that their initial or updated NDCs provide a legal, regulatory and political framework for reducing emissions and assessing a sector's mitigation potential. Some Parties reported that technology needs assessments assist them in identifying and prioritizing key mitigation technologies on the basis of national needs.

35. In relation to implementing mitigation options, Parties reported that capacity-building was provided for, inter alia:

(a) Building staff capacity of institutions involved in climate action, for example through training on tools for integrated resource planning, GHG mitigation assessment, mitigation scenario modelling and development of long-term low-emission development strategies (e.g. the Low Emissions Analysis Platform); validation workshops, where the outcomes of modelling exercises and subsequent actions are shared with all stakeholders for validation and approval; and training on conducting mitigation assessment and MRV of mitigation actions;

(b) Strengthening public–private collaboration to foster innovation, mobilize investment and scale up sustainable mitigation solutions;

(c) Leveraging bilateral and multilateral cooperation to promote ambitious climate action through policy dialogue, regional networking, practitioner-based exchanges and identification and dissemination of best practices and lessons learned.

36. Parties reported examples of capacity-building support provided for implementing mitigation options in the following sectors:

(a) Carbon: developing legal frameworks for regulating carbon markets;

(b) Agriculture: using smart technologies for farming;

(c) Industrial processes and product use: raising awareness among technicians and end users of the adverse impacts of different GHGs, engaging industry experts in international working groups to explore the feasibility of capturing, transporting and storing carbon dioxide, and developing building codes to ensure the use of suitable materials in construction;

(d) Coastal and marine ecosystems: piloting options for restoring mangroves to enhance carbon sequestration;

(e) Energy: training local populations to build their capacity on installation and maintenance of renewable energy systems and equipment, enhancing incentives for using renewable energy systems, advancing sustainable electric mobility plans, conducting studies on geothermal potential, and developing public awareness programmes to promote cleaner cooking stoves;

(f) Transport: providing gender-sensitive training to bus drivers within the framework of promoting public transport use;

(g) Waste: establishing recycling clubs and competitions to raise awareness of recycling among schoolchildren.

37. Parties identified capacity-building needs for implementing mitigation options, including:

(a) Increasing access to climate finance to facilitate access to and accelerated implementation of clean technologies in all sectors, and for long-term investments in infrastructure, training, and research and development;

(b) Establishing robust MRV systems for planning, coordinating and implementing mitigation options and providing the training needed to use those systems effectively;

(c) Strengthening institutional and technical capacities to support effective mitigation planning, implementation and evaluation, through robust frameworks, improved tracking and assessment of mitigation policies and measures, and enhanced understanding and application of accounting methodologies across all sectors, including prioritizing key sectors such as agriculture, transport, industrial processes and product use, and waste, as well as identifying and assessing the co-benefits and broader socioeconomic and environmental impacts of mitigation actions.

38. Many Parties identified sector-specific capacity-building needs, including developing energy efficiency standards, enhancing the value generated through circular economy value chains, providing training for and accreditation of technicians responsible for installing solar photovoltaic systems and operating hydroelectric facilities, and providing training on geographic information systems to improve data sources and to estimate emissions in the forestry and other land use sector.

I. Research and systematic observation, including meteorological, hydrological and climatological services

39. Some Parties reported capacity-building undertaken for strengthening research and systematic observation, such as:

(a) Establishing multiple financing mechanisms involving government, the private sector and non-governmental organizations; and promoting research and development, scientific and technical training and services, modernization of research infrastructure, technology transfer, access to specialized scientific facilities and innovation;

(b) Establishing new research institutions and university programmes covering topics such as meteorological and climatological data collection and QA/QC procedures, satellite-based Earth observation for climate and disaster monitoring, biodiversity management and conservation, climate change risk analysis and adaptation strategies, climate-smart agriculture, carbon capture and storage, low-carbon economies, the physical and social impacts of climate change, resilience-building and urban climate change;

(c) Creating research networks and forums on topics such as environmental monitoring and climate observation;

(d) Developing and launching tools, observation stations and systems to support tracking of carbon and emissions, water resources management, waste tracking,

environmental impact assessments, real-time data collection on weather, and sand and dust monitoring;

(e) Strengthening hydrometeorological services to enhance the provision of quality data for climate modelling to inform decision-making and policy development;

(f) Strengthening regional collaboration and partnerships through coordinated frameworks and shared platforms to improve access to tools, methodologies and technical expertise.

40. Many Parties, however, highlighted their limited institutional, technical, technological and financial resources for research and systematic observation, which adversely affects the quality and quantity of research outputs, as well as the effectiveness of related services. Specific challenges noted include insufficient technical capacity for data analysis, the absence of clear policies and mandates for data collection, and a general lack of public interest and engagement in climate change research.

41. Parties highlighted capacity-building needs for strengthening research and systematic observation, such as:

(a) Enhancing collaboration between hydrometeorological agencies and research and academic institutions to facilitate research on ways of improving weather, water and climate-service value chains;

(b) Strengthening collaboration between government agencies and the scientific community to increase public awareness of and enhance reporting on and dissemination of climate-related research to inform decision-making and responses to climate change;

(c) Establishing legislative frameworks to ensure that climate research and monitoring systems are aligned with internationally recognized standards; to promote consistency, quality and comparability of data; and to facilitate effective knowledge-sharing;

(d) Enhancing collaboration between observation networks and facilitating integration of their data into a consolidated and comprehensive database;

(e) Strengthening technical expertise in various areas critical to climate observation and analysis, including forecasting, numerical weather prediction, radar technology, environmental and ecological modelling, machine learning, geographic information systems, geoengineering, solar radiation management, economic forecasting, engineering, data science and the integration of emerging technologies such as the Internet of things and artificial intelligence into observation and monitoring systems;

(f) Advancing systematic data interpretation and climate modelling to improve accuracy and their application in policymaking.

J. Development and transfer of technology

42. Some Parties emphasized that including a capacity-building component in the demonstration, deployment and diffusion of technologies is key to ensuring success in the transfer of technology. Parties described a wide range of capacity-building efforts in this area, including:

(a) Developing institutional frameworks for cooperation on technology development and transfer and establishing dedicated departments or technical working groups across key government ministries, including for the energy, agriculture and transport sectors, to promote the use of and provide guidance on climate technologies;

(b) Identifying technology needs and priority sectors through technology needs assessments and national capacity needs self-assessments and in the context of NC preparations, and defining measures for facilitating rapid implementation and dissemination in technology action plans;

(c) Enacting legislative and regulatory reforms to incentivize climate technology transfer, such as legislation on innovation, tax exemptions for climate technologies and credits for individuals, businesses and entities with green certificates;

(d) Providing easier access to finance for climate technologies, such as via green loans from commercial banks for installing solar panels or mobile phone applications facilitating funding for adaptation technologies for farmers;

(e) Increasing financial investment in the research and development of innovative and emerging technologies, and strengthening existing technologies, such as pilot schemes offering results-based payment incentives to boost the dissemination of new technologies in the decarbonization process within the steel industry;

(f) Raising awareness of and fostering interest in climate technologies among a broad range of stakeholders, for example via green technology fairs;

(g) Harnessing international collaboration to facilitate knowledge-sharing and accelerate the transfer of technologies, for example using bilateral crediting mechanisms to acquire solar energy technology or participating in networks promoting South–South, North–South and triangular cooperation in relation to technologies for adaptation and mitigation.

43. Parties reported various capacity-building needs for technology transfer, including:

(a) Enhancing human and financial capacity to assess and identify technology needs and conduct market assessment and feasibility studies for the adoption of new technologies;

(b) Fostering an enabling environment for the effective deployment of climate technologies by developing legislative and policy frameworks to support coordination efforts, establishing market standards for promoting adaptation and mitigation technologies, and strengthening staff capacity to implement these measures;

(c) Enhancing capacity in the public and private sectors for conducting research on climate technologies, such as in relation to thermal power plants, wind energy, energy storage systems, electric vehicles, carbon capture and storage, climate-resilient agriculture and bioenergy.

K. Improved decision-making, including assistance for participation in international negotiations

44. Parties noted that activities under the Convention, such as establishing domestic MRV systems, have helped to enhance the decision-making capacity of institutions by improving the quality of and access to climate-related data, information and knowledge.

45. Some Parties reported on further capacity-building measures provided for strengthening decision-making processes, such as developing a web-based platform for tracking, analysing and advancing progress towards the transition to a low-carbon economy and climate-resilient society; providing tools to support the development of national policies and support decision-making; holding national consultative conferences involving government stakeholders, civil society groups, researchers and the general public to discuss and reach consensus on how to proceed on contentious climate-related topics; and forming an international coalition of Parties to share knowledge and find common ground ahead of participating in climate change negotiations.

46. Parties also reported on initiatives aimed at building the leadership and negotiation skills of female delegates with a view to increasing the participation of women in international climate change negotiations, and establishing designated travel funds to enable women, grass-roots groups, Indigenous Peoples and local communities to participate in international negotiations under the UNFCCC.

L. Clean development mechanism

47. Parties with projects registered under the CDM reported a halt in new project registrations and explained that they have initiated the process of transitioning their projects to the carbon crediting mechanisms under the Paris Agreement. Therefore, no Parties reported on capacity-building activities related to the CDM.

M. Needs arising from the implementation of Article 4, paragraphs 8–9, of the Convention

48. The least developed country Parties reported targeted capacity-building efforts pursuant to Article 4, paragraph 9, of the Convention, such as support provided under a GEF-funded project on strengthening climate resilience by improving access to best practices; support for promoting innovation and digital transformation; support for knowledge-sharing between countries participating in the Great Green Wall initiative; and support under an initiative to unlock and catalyse private finance to mitigate the negative effects of the coronavirus disease 2019 pandemic on energy access in Africa. Some countries that are particularly vulnerable to the impacts of climate change reported on capacity-building efforts pursuant to Article 4, paragraph 8, of the Convention, including support under a GEF-funded project on building capacity for and mainstreaming sustainable land management.

49. Reported capacity-building needs relate, inter alia, to lack of financial resources, leading to understaffing and lack of technical capacity, and lack of resources to generate and collect reliable data to support planning and decision-making.

N. Education, training and public awareness

50. Parties emphasized the importance of education, training and public awareness in driving capacity-building and support for action. Many highlighted progress in this area, describing efforts that have contributed to capacity-building, such as:

(a) Education: including the subject of climate change in primary and secondary school curricula, distributing educational materials at community information centres, launching an ‘eco-school’ pilot programme, introducing university courses on climate change and disaster risk management and implementing a programme aimed at educating secondary school and university students on climate change issues and international climate change negotiations;

(b) Training: providing journalists with tools for more accurate and impactful climate reporting and integrating climate topics into teacher training programmes (see also chap. III.E–I above for further examples of sector-specific training);

(c) Public awareness: holding interactive exhibitions at trade fairs; participating in radio and television programmes featuring interviews with climate experts and community-centred discussions on climate issues; developing campaigns to encourage climate action by marginalized groups; engaging with traditional leaders, mothers’ organizations and religious groups on climate-related topics; providing information material in local languages; issuing calls for engagement in climate action via instant messaging platforms; and implementing social media campaigns to increase knowledge of climate and health issues.

51. Most Parties noted that, while knowledge and awareness of topics related to climate change have grown, further capacity-building is needed in areas such as:

(a) Mainstreaming climate change in both formal curricula and informal educational settings, as well as in teacher training programmes;

(b) Enhancing distance-learning and online learning formats and tools and improving the required digital and technical infrastructure;

(c) Encouraging more universities and research institutions to introduce courses or programmes on climate change, and establishing research groups to support capacity-building efforts;

(d) Using social media channels to raise awareness of topics such as climate change, disaster risk preparedness, solid waste management, the benefits of renewable energy, and energy efficiency;

(e) Preparing outreach campaigns on diverse climate and sustainability issues targeted at marginalized groups, including rural and migrant communities, the elderly and

persons with disabilities, ensuring that information is provided in Indigenous and local languages, as well as those spoken by migrant communities;

(f) Conducting online campaigns to boost awareness of climate issues and encourage meaningful participation of key stakeholders, such as national Governments, local authorities and private investors, in decision-making processes concerning climate action.

O. Information and networking, including establishment of databases

52. Parties described activities within various networks, including:

(a) International networks, such as the Carbon Neutrality Coalition, the Carbon Pricing Leadership Coalition, the Center for International Forestry Research and World Agroforestry, the Climate for Peace Initiative, the Consultative Group on International Agricultural Research, the Greening Government Initiative, the Ibero-American Network of Climate Change Offices, the Mountain Partnership, the National Adaptation Plan Global Network, the Net-Zero Government Initiative, the Paris Agreement Article 6 Implementation Partnership, the Partnership on Transparency in the Paris Agreement and the San José Principles Coalition;

(b) Regional networks, such as the Asian Network on Climate Science and Technology, the Association of Southeast Asian Nations Centre for Energy, the Caribbean Centre for Renewable Energy and Energy Efficiency, the Caribbean Community Climate Change Centre, the Caribbean Cooperative MRV Hub, the Caribbean Youth Environment Network, the Eastern Caribbean Solar Challenge, the Interreg Sudoe Programme in South-Western Europe, the Program for Accelerating Climate Change Adaptation in the Caribbean Region, the Pyrenees Climate Change Observatory and the St. George's Declaration of Principles for Environmental Sustainability in the Organisation of Eastern Caribbean States;

(c) National networks, such as agricultural livestock and research organizations, coalitions of civil society organizations on climate change, coalitions of non-governmental organizations and associations working on REDD+, environmental observation networks, farmer research groups, a network of communicators on climate change and youth network coordination on climate change.

53. Parties also reported on bilateral exchanges with other Parties and on South–South, North–South and triangular cooperation to share information on specific topics and address capacity-building needs.

IV. Emerging or new areas for capacity-building

54. The evolving nature of climate science and policy and the adoption of new arrangements under the UNFCCC have led to emerging or new capacity-building efforts and needs. The emerging or new areas for capacity-building mentioned in Parties' reports, although linked to the overarching themes of the capacity-building framework, do not fall within the scope of its 15 priority areas.

55. Several Parties reported many of the areas for capacity-building identified as new in previous synthesis reports on implementation of the capacity-building framework.[12] Additional new and emerging areas reported include capacity-building for low-carbon procurement, behavioural change for adopting more sustainable habits and practices, sustainable urban planning and green economic planning.

56. Parties also reported undertaking capacity-building efforts in areas that fall beyond the scope of the current framework, with the following areas being reported on most frequently, as well as being most often identified as requiring further support:

[12] FCCC/SBI/2024/2, FCCC/SBI/2023/3 and FCCC/SBI/2022/2.

(a) Reporting requirements under the ETF, including for preparing GHG inventories, tracking progress towards achieving NDCs and identifying and reporting on financial, technological and capacity-building support required and received;

(b) New carbon markets, including strengthening institutional and regulatory frameworks, for example by revising national climate legislation to include consideration of carbon markets and increase readiness for participating in the various mechanisms established under Article 6 of the Paris Agreement and other national and voluntary markets as a means of supporting the implementation of NDCs or as a source of finance for adaptation actions;

(c) Just transition, including integrating a just transition framework into climate action plans and thereby boosting inclusive participation in the process towards a climate-resilient and low-carbon economy; developing new legal and policy frameworks and identifying investment opportunities pertaining to achieving a just transition; enabling and promoting innovation, entrepreneurship and the creation of green jobs; developing business incubation hubs for youth; launching a programme aimed at supporting women's enterprises; and training Indigenous communities, for example in using smart technologies in the context of mangrove ecosystem protection with a view to creating more sustainable livelihoods. Some Parties reported a need for training or retraining in performing green jobs, as well as for the development and installation of renewable energy infrastructure and the necessary technology transfer to do so.

V. Capacity-building support received to address gaps and needs within the scope of the capacity-building framework

57. Developing country Parties that included sections in their NCs on capacity-building support received reported support received in areas such as preparing GHG inventories, applying the 2006 IPCC Guidelines and identifying appropriate methodologies for estimating GHG emissions and removals for different sectors, using data-collection templates, implementing QA/QC procedures, enhancing mitigation MRV, using the Greenhouse Gas Abatement Cost Model, developing frameworks for emission projections, planning adaptation actions, participating in climate negotiations, accessing climate finance, implementing Article 6 of the Paris Agreement, monitoring and evaluating key metrics used to measure and track progress towards implementing and achieving NDCs in the energy sector, implementing and enhancing NDCs, developing regulatory frameworks, enhancing stakeholder engagement in climate action, assessing policy impacts and preparing national reports to the UNFCCC.

58. Several Parties reported receiving support for preparing for the transition to the ETF through the CBIT–GSP, funded by the GEF and implemented by the United Nations Environment Programme. Other providers of training mentioned include the Consultative Group of Experts, the Greenhouse Gas Management Institute, the Initiative for Climate Action Transparency, the IPCC, the Lusophone Cluster of the Partnership on Transparency in the Paris Agreement, the National Institute for Environmental Studies (Japan), the NDC Partnership and the Stockholm Environment Institute.

59. Most Parties reported, to varying degrees, that they received capacity-building support for mitigation, adaptation and technology development and transfer. Some Parties provided examples of projects categorized as capacity-building, while some mentioned all projects with a capacity-building component for which funding was received. Parties highlighted that international support has helped to strengthen the institutional and technical capacity required to design, implement and report on adaptation and mitigation actions.

60. The operating entities of the Financial Mechanism, namely the GCF and the GEF, account for a significant share of the support provided for adaptation and mitigation projects, followed by a range of international, multilateral and bilateral sources, including the African Development Bank Group, the European Development Fund, the United Nations Development Programme, the World Bank Group and national Governments.

VI. Capacity-building activities under the Kyoto Protocol

61. The 2024 annual report of the CDM Executive Board to the CMP highlights the role of regional collaboration centres in capacity-building, including by providing support for existing project activities, supporting developing countries in relation to CDM methodologies and promoting the use of the CDM and certified emission reductions in the development of climate strategies. During the reporting period, regional collaboration centres supported Parties in transitioning from the CDM to the Article 6.4 mechanism by assisting in the development of standardized baselines, particularly in updated default values, for activities under Article 6, paragraph 4, of the Paris Agreement.

62. To facilitate the transition of CDM activities to the Article 6.4 mechanism, the CDM Executive Board held a calibration workshop to strengthen the capacity of designated operational entities to verify CDM activities that have transitioned to the Article 6.4 mechanism, deepen their understanding of the mechanism and enable their auditing and technical staff to share experience in implementing regulations related to the mechanism. The CDM Executive Board also held a knowledge-sharing workshop for the CDM accreditation roster of experts for lead assessors to update them on the latest CDM regulations and the latest regulatory documents for the Article 6.4 mechanism.