Framework Convention on
Climate Change

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

Synthesis report on the information identified in decision 19/CMA.1, paragraph 36 (d)

Prepared by the secretariat under the guidance of the co-facilitators of the technical dialogue of the first global stocktake

Contents

Abbreviation and acronyms

AC	adaptation communication
AF	Adaptation Fund
Annex I Party	Party included in Annex I to the Convention
Annex II Party	Party included in Annex I to the Convention
BA	biennial assessment and overview of climate finance flows
BR	biennial report
BTR	biennial transparency report
BUR	biennial update report
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
COVID-19	coronavirus disease 2019
CTCN	Climate Technology Centre and Network
CTF	common tabular format
DAC	Development Assistance Committee
EU	European Union
GCF	Green Climate Fund
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
KCI	Katowice Committee of Experts on the Impacts of the Implementation of Response Measures
LDC	least developed country
LDCF	Least Developed Countries Fund
LEDS	low-emission development strategy(ies)
MDB	multilateral development bank
MRV	measurement, reporting and verification
NAMA	nationally appropriate mitigation action
NAP	national adaptation plan
NAPA	national adaptation programme of action
NC	national communication
NDA	national designated authorities
NDC	nationally determined contribution
NDE	nationally designated entity
NDR	Report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement
ODA	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
PCCB	Paris Committee on Capacity-building
PPCR	Pilot Program for Climate Resilience
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)
SBI	Subsidiary Body for Implementation
SCCF	Special Climate Change Fund
SCF	Standing Committee on Finance
SDG	Sustainable Development Goal
SIDS	Small island developing State(s)
SREP	Scaling Up Renewable Energy Program
TA	technology action plan
TEC	Technology Executive Committee
TNA	technology needs assessment
UNFCCC	United Nations Framework Convention on Climate Change

WIM	Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts
WB	World Bank

I. Executive summary

1. The global stocktake is to assess collective progress made in achieving the purpose of the Paris Agreement and its long-term goals, including with regard to the issue of support relating to finance, technology and capacity-building. The mandate of this synthesis report is elaborated in the introduction.

2. To facilitate the deliberations during the technical assessment component of the first global stocktake and in order to set the frame for the information provided in this report, this synthesis report provides an overview of the various relevant mandates and elements pertaining to finance, technology and capacity, followed by contextual information on the scale of climate finance flows, the integration of climate change considerations in broader finance flows and investments, and the means of implementation needed.

3. The contextual information draws from a range of sources, including (a) reports mandated by the COP and CMA that encompass available data and information on finance, technology and capacity-building from national reports submitted to the UNFCCC, regional and global reports and databases; (b) national reports submitted to the UNFCCC; and (c) other available sources of information. It should be noted that several reports mandated by the COP and CMA from which this synthesis report draws, particularly BAs and the first NDR, aggregate data and information from national reports to the UNFCCC, as well as from other available regional and global reports and databases. Therefore, at the point that this synthesis report was being prepared, these reports represent the most comprehensive sources of overview of available information on matters relating to global, developed-to-developing countries, and domestic climate finance flows; information related to Article 2, paragraph 1(c); and the needs of developing countries. Furthermore, most of the available underlying data and information across all sources of information cover the period up to 2017–2018 on climate finance flows and up to 2020–2021 on Article 2, paragraph 1(c) matters and needs. Therefore, and in order to avoid overlap or duplication of underlying data and information, this synthesis report relies mostly on data and information on trends up to and including 2020, as collected and analysed in the fourth BA and the first NDR.

A. Finance

4. Although improvements have been made over the past few years, challenges and limitations remain, including in collecting, aggregating and analysing data and information from diverse sources. These limitations should be taken into consideration when deriving conclusions from, and assessing the information on, global climate finance flows, flows from developed to developing countries, domestic finance and other subflows.

5. The fourth BA and first NDR, prepared by the SCF in 2021 and acknowledged by COP 26 and CMA 3, provide important insights. The following are of particular relevance to the technical assessment component of the first global stocktake:

(a) Information related to Article 2, paragraph 1(c), of the Paris Agreement:

(i) Estimates of global climate finance flows increased by 16 per cent in 2017–2018 compared with 2015–2016, reaching an annual average of USD 775 billion per year. The growth was largely driven by further investment in renewable energy, aided by lower technology costs, as well as investments in sustainable transport infrastructure, including electric vehicles;

(ii) Although flows are increasing, they remain relatively small in the context of investments needed to fulfil a pathway towards low GHG emissions and climate-resilient development, which are typically USD 1.6–3.7 trillion per year in the energy sector alone;

(iii) In contrast, financial flows in GHG-intensive activities remain concerningly high. Fossil fuel investments globally amounted to USD 977 billion per year on average in 2017–2018, while fossil fuel subsidies amounted to USD 472 billion in 2018. Fossil fuel corporate capital expenditure at risk of becoming stranded amounted

to USD 50 billion in 2018, while investments with deforestation risks amounted to USD 43.8 billion in 2017–2018, and net agriculture subsidies amounted to USD 619 billion per year on average from 2017 to 2019;

(iv) Significant growth in relevant initiatives has been apparent since the Paris Agreement entered into force, particularly in coalitions fostering collective commitments on climate action. This highlights the importance of network effects, knowledge-sharing and common goal setting. Efforts relevant to Article 2, paragraph 1(c), occur across all types of actor within the financial sector, including investors, banks and regulators. Investors and asset managers representing USD 6.6 trillion and USD 43 trillion in assets under management, respectively, and banks representing USD 38.6 trillion in financial assets have pledged to align lending and investment portfolios with net zero emissions by 2050;

(v) Assessing the real-economy impact and the risk of greenwashing remains a challenge. Many actors in the financial sector operate at a number of steps removed from real-economy activities, through stock or bond trading, portfolio allocations, or microprudential supervision, which have little direct effect on real-economy investment decisions related to banks lending to projects, corporations approving capital expenditure plans or governments announcing support incentives. Therefore, measuring the effective role of financial actors in the context of Article 2, paragraph 1(c), is a notable topic of debate among initiatives, including which metrics are most important as indicators of success.

(b) Available information related to the provision of means of implementation and mobilization of support with regard to climate finance from developed to developing countries[1] covering the period up to 2017–2018 includes the following:

(i) On the basis of the fourth BRs submitted as of November 2021, total financial support to non-Annex I Parties reached USD 48.8 billion in 2017 and USD 55.3 billion in 2018 respectively. This represents an increase of 5.7 per cent over the 2015–2016 biennial period. Climate-specific financial support, which accounts for almost three quarters of the financial support average reported, increased by 8 per cent to USD 37.8 billion per year on average. Most climate-specific financial support was channelled through bilateral, regional and other channels;

(ii) In terms of inflows into the operating entities of the Financial Mechanism, the seventh replenishment of the GEF led to USD 4.1 billion in pledges and USD 802 million allocated to the climate change focal area, compared with USD 4.4 billion in total pledges and USD 1.26 billion allocated to the climate change focal area in the sixth replenishment. The GEF noted the climate co-benefits to other focal areas including biodiversity and land degradation, with a goal to provide climate-related finance of at least 60 per cent of total GEF funding commitments over the four-year period for the cross-focal area. The first replenishment of the GCF Pledging Conference in 2019 amounted to USD 9.8 billion, compared with USD 10.2 billion from the Initial Resource Mobilization Pledging Conference in 2014. In terms of climate finance commitments from multilateral climate funds to projects in developing countries, USD 2.7 billion per year on average in 2017–2018 was committed, representing an increase of 39 per cent from 2015–2016;

(iii) MDBs provided USD 34 billion and USD 42 billion in climate finance[2] from their own resources to developing and emerging economies in 2017 and 2018,

[1] For the purpose of the overview of climate finance, the BA prepared by the SCF uses various data sources to illustrate flows from developed to developing countries, without prejudice to the meaning of those terms in the context of the Convention and the Paris Agreement, including but not limited to Annex I and Annex II Parties to non-Annex I Parties and MDBs; OECD members to non-OECD members; and OECD DAC members to countries eligible for OECD DAC ODA.

[2] Climate finance of MDBs includes several types of instrument, including investment loans, equity, bonds and guarantees. The full list of types of instrument can be viewed in the MDB methodology in annex E to the 2020 Joint Report on Multilateral Development Banks' Climate Finance accessible here: https://thedocs.worldbank.org/en/doc/9234bfc633439d0172f6a6eb8df1b881-0020012021/original/2020-Joint-MDB-report-on-climate-finance-Report-final-web.pdf

respectively. The annual average (USD 36.6 billion) across these two years represents a 50 per cent increase since 2015–2016. The attribution of these flows to developed countries is calculated at between USD 23.3–24.1 billion in 2017 and USD 25.8–28.0 billion in 2018;

(iv) Estimates of private climate finance mobilized by developed countries through public interventions deployed by bilateral and multilateral channels, including multilateral climate funds and MDBs, amounted to USD 14.5 billion in 2017 and USD 14.6 billion in 2018;

(v) Estimates of climate finance received through the BURs of non-Annex I Parties remain limited. USD 7.8 billion was reported as received for projects starting in 2017 and USD 2 billion for projects starting in 2018 by 28 Parties;

(vi) Support for mitigation remains greater than support for adaptation. Mitigation finance constitutes the largest share of climate-specific financial support through bilateral channels reported by Annex II Parties, at 66 per cent. However, the share of adaptation finance increased from 15 per cent in 2015–2016 to 20 per cent in 2017–2018, as it grew at a higher rate than mitigation finance. The remaining 14 per cent was allocated to cross-cutting activities which serve both mitigation and adaptation objectives., Adaptation finance accounted for 20 per cent from multilateral climate funds, and 25 per cent from MDBs;

(vii) Grants continue to be a key instrument for adaptation finance. In 2017–2018 grants accounted for 64 and 94 per cent of the face value of bilateral adaptation finance reported to OECD and of adaptation finance from multilateral climate funds, respectively. During the same period, 9 per cent of adaptation finance flowing through MDBs was grant-based. These figures indicate no change since 2015–2016. Mitigation finance, by contrast, had 30 per cent of bilateral flows, 29 per cent of multilateral climate fund approvals and 3 per cent of MDB investments taking the form of grants;

(viii) In 2017–2018 the Asia region received on average 30 per cent of funding commitments from bilateral flows, multilateral climate funds and MDBs. Sub-Saharan Africa received an average of 24 per cent of commitments across the sources in the same period, Latin America and the Caribbean received 17 per cent and the remainder going to the Middle East and North Africa; Central, Eastern and South-Eastern Europe; the South Caucasus; and Central Asia;

(ix) In 2017–2018 funding committed to projects in the LDCs represented 22 per cent of bilateral flows and 24 per cent of finance approved through multilateral climate funds. Funding committed to SIDS represented 2 per cent of bilateral finance and 10 per cent of finance approved through multilateral climate funds. Of the finance provided to the LDCs and SIDS, the amount targeting adaptation fell slightly in 2017–2018, although the shares remained stable overall. MDBs channelled 11 per cent of their climate finance to the LDCs and 3 per cent to SIDS. As in previous years, adaptation finance as a share of all climate finance to these countries was significantly higher than that of the overall climate finance spending by MDBs;

(x) In 2017–2018, there continued to be a push to diversify modalities of access to climate finance. In a 2019 survey of 105 respondents from 45 developing countries, 73 per cent identified finance from multilateral climate funds as the most challenging source of finance to access compared with private finance (62 per cent), MDBs and development finance institutions (30 per cent) and bilateral sources (17 per cent). Data show a continued increase in the number of national implementing entities of multilateral climate funds, as well as an increase in the accreditation of civil society and private entities, with both trends largely driven by the GCF. However, significant shares of climate finance approvals from multilateral climate funds are programmed through international multilateral accredited and implementing entities.

(c) Information related to the needs of developing countries includes the following:

(i) The needs of developing countries related to implementing the Convention and the Paris Agreement as derived from national reports can be distinguished by quantitative (costed needs) and qualitative (unquantified) needs. As at 31 May 2021, costed needs ranged USD 5.8–5.9 trillion up until 2030 as identified across 78 NDCs, to USD 8.8–8.9 trillion as identified across 46 NCs and USD 11.5 trillion as identified across 24 BURs. Qualitative needs range from 4274 needs identified across 153 NDCs to 6900 identified needs across 149 NCs and 2044 needs identified across 62 BURs.

(ii) In terms of thematic distribution of needs, cumulatively, identified costed mitigation needs tend to be larger than costed adaptation needs across the reports that cover all thematic areas such as BURs (USD 5.3 trillion and USD 3.6 trillion, respectively), NCs (USD 5.02 trillion and USD 3.8 trillion, respectively) and NDCs (USD 2.2 trillion and USD 7.6 billion, respectively). In qualitative terms, needs related to adaptation are mentioned more often than those related to mitigation in all report types except BURs and long-term LEDS, indicating greater attention to supporting the expressed adaptation needs of developing countries. On the basis of the number of mitigation needs expressed across the nine national report types, energy is the lead sector for support needed for climate change mitigation actions, followed by land use and forestry, transport, agriculture, and waste and sanitation. On the basis of the number of adaptation-related needs expressed across the nine national report types, agriculture and water are the two lead sectors for support needed for climate change adaptation actions, followed by disaster prevention and preparedness, coastal zone management and health;

(iii) With respect to distribution of needs by means of implementation, qualitative data show a significant prevalence of capacity-building and technology development and transfer needs. The number of capacity-building needs is higher than that of finance needs and technology development and transfer needs identified in the nine national report types, except in TNAs;

(iv) Developing country Parties also communicate other areas of need that involve issues such as gender, indigenous peoples and vulnerable groups, as well as expressed needs for policy development linked to the SDGs and the Addis Ababa Action Agenda. Such needs are in most cases expressed in qualitative terms;

(v) To outline the mitigation needs of developing countries, regional and global reports use a mix of energy–economy and integrated assessment models for scenarios of below 2 °C, ranging from USD 2.4 to 4.7 trillion in annual energy-related investment needs globally; investment opportunities based on stated national plans and targets including and beyond NDCs, ranging from USD 23.8 to 29.4 trillion for emerging markets from 2016 to 2030; and investment estimates for achieving conditional NDC targets using carbon prices, for example USD 715 billion in Africa;

(vi) Estimates related to adaptation and resilience derived from regional and global reports range from costs based on bottom-up national and sector-based studies (ranging from USD 140 to 300 billion annually by 2030) measuring impacts to GDP (for example, ranging from USD 289.2 to 440.5 billion up to 2030 in Africa) and the incremental investment needed to upgrade or retrofit infrastructure stock (ranging from USD 11 to 670 billion in annual incremental costs).

6. COP 26 and CMA 3 resulted in various mandates to ensure the continuation of work on the issue of climate finance, including with regard to assessing progress made on finance matters. This includes the request to the SCF to continue its work on definitions of climate finance, taking into account the submissions received from Parties on this matter, with a view to providing input for consideration by COP 27 and CMA 4.[3] On the issue of Article 2, paragraph 1 (c) of the Paris Agreement, CMA 3 invited Parties, the operating entities of the Financial Mechanism, international financial institutions and other stakeholders in the financial sector to submit views regarding ways to achieve this goal, including options for approaches and guidelines for implementation, and requested the SCF to submit a synthesis for consideration by CMA 4. COP 26 requested the SCF to undertake further work on

[3] Decision 4/CP.26, para. 12, decision 5/CP.26, para. 7, and decision 10/CMA.3, para 3.

mapping the available information relevant to Article 2, paragraph 1(c), including its reference to Article 9 of the Agreement, with a view to providing input for consideration by COP 27.[4]

7. Moreover, Parties were encouraged to ensure that just transition financing is incorporated into approaches to align climate action with the goals of the Paris Agreement.[5] Parties were also requested to continue to enhance their enabling environments and policy frameworks to facilitate the mobilization and effective deployment of climate finance in accordance with decision 3/CP.19.[6]

8. The technical assessment component of the first global stocktake is mandated to assess collective progress towards the long-term goal on finance, pursuant to Article 14 of the Paris Agreement. The Paris decision adopting the Agreement decided that, in accordance with Article 9, paragraph 3, of the Paris Agreement, developed countries intend to continue their existing collective mobilization goal through 2025 in the context of meaningful mitigation actions and transparency on implementation; prior to 2025 the CMA shall set a new collective quantified goal from a floor of USD 100 billion per year, taking into account the needs and priorities of developing countries.[7] In terms of assessment of progress towards achieving the goal of mobilizing jointly USD 100 billion per year to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation, COP 26 requested the SCF to prepare a report in 2022, taking into account the Climate Finance Delivery Plan and other relevant reports, for consideration by COP 27, and to continue to contribute to assessing the achievement of the goal in the context of the preparation of its BAs.[8] The technical assessment of the first global stocktake may assess this information once it becomes available, as well as the progress made in other areas, including with regard to the CMA 3 decision to initiate the process for the deliberations on setting a new collective quantified goal.[9]

B. Technology

9. Under Article 10, paragraph 1 of the Paris Agreement, Parties share a long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce GHG emissions. In addition, the Paris Agreement contains the following provisions on technology development and transfer:

(a) Parties, noting the importance of technology for the implementation of mitigation and adaptation actions under this Agreement and recognizing existing technology deployment and dissemination efforts, shall strengthen cooperative action on technology development and transfer;[10]

(b) Support, including financial support, shall be provided to developing country Parties for the implementation of this Article, including for strengthening cooperative action on technology development and transfer at different stages of the technology cycle, with a view to achieving a balance between support for mitigation and adaptation.[11]

10. Regarding the progress made by Parties in strengthening cooperative action on technology development and transfer for mitigation and adaptation and support provided to developing country Parties, this synthesis report found that:

(a) The provision of support for technology development and transfer has increased significantly. Developed country Parties have more than doubled their support for technology transfer activities since 2012–2013. The support for technology development and

[4] Decision 10/CMA.3, para. 2, and decision 4/CP.26, para. 13.
[5] Decision 5/CP.26, para. 10.
[6] Decision 4/CP.26, para. 10.
[7] Decision 1/CP.21, para 53.
[8] Decision 4/CP.26, para.19.
[9] Decision 9/CMA.3, para.1.
[10] Paris Agreement, Article 10, para. 2.
[11] Paris Agreement, Article 10, para. 6.

transfer encompasses support for both hardware (equipment) and software (know-how, methods and practices);

(b) Bilateral cooperation continues to be the predominant channel of international support for technology transfer activities. While sources of funding for supporting implementation of technology transfer activities were in most cases public, Parties reported on the increasing role of public–private partnerships in undertaking technology transfer activities;

(c) More than half of the supported activities related to mitigation technology, almost a quarter to adaptation technology and the remainder related to technologies that cut across both mitigation and adaptation;

(d) The technology transfer activities reported by Parties are predominantly related to the latter stages of the technology cycle, namely the deployment of mature technologies. However, support for the early stages of the technology cycle (technology research and development and demonstration of new technologies) has increased.

11. In relation to technology needs of developing country Parties for achieving the long-term vision of fully realizing technology development and transfer in order to improve resilience to climate change and reduce GHG emissions, this synthesis report reveals that:

(a) With regard to information on technology development and transfer for the implementation of NDCs, many Parties referred to technology development and transfer in the context of actions that inherently address both adaptation and mitigation or focus solely on mitigation;

(b) Information provided by Parties on climate technology related matters was mainly on specific technologies to be deployed; technology needs; policy, regulatory and legal aspects; technology innovation, research and development; and support required by Parties or support provided by Parties for technology development and transfer;

(c) In terms of specific technologies that Parties intend to use for achieving their adaptation and mitigation targets, those most frequently identified were cross-sectoral energy-efficient appliances and processes; enhanced use of renewable energy technologies such as hydropower, solar, wind and biomass; low- or zero-emission vehicles; blended fuel; waste to energy technologies; and climate-smart agriculture;

(d) Technology needs mentioned by Parties were mainly in the areas of energy, agriculture, water, waste, transport, climate observation and early warning. With regard to technology innovation, research and development, some Parties included information on promoting collaboration between countries and promoting institutions, mechanisms, tools and business models that foster progress in this area. Actions on policy, regulatory and legal aspects commonly referred to by Parties included developing or updating policies and strategies to promote technology innovation, promoting use of renewable energy and accelerating adoption and transfer of climate technologies.

12. Despite the progress made in strengthening cooperative action on technology development and transfer for the implementation of mitigation and adaptation actions and increased support for developing countries for technology development and transfer, gaps and challenges remain in achieving the long-term vision referred to in Article 10 of the Paris Agreement:

(a) For mitigation, the most commonly reported categories of barrier to the development and transfer of the prioritized technologies reported by developing country Parties were economic, financial and technical. Within the economic and financial category, most Parties identified lack of, or inadequate access to, financial resources as the main barrier. In the technical category, many Parties identified system constraints, insufficient expertise, and inadequate standards, codes and certification as the main barriers;

(b) For adaptation, almost all Parties reported the following categories of barrier to the development and transfer of prioritized technologies: economic and financial; policy, legal and regulatory; institutional and organizational capacity; and human skills. Within the first two categories, Parties identified lack of, or inadequate access to, financial resources and insufficient legal and regulatory frameworks as the main barriers.

C. Capacity-building

13. Capacity-building is addressed in the Paris Agreement under Article 11. Although Article 11 does not state a long-term goal, capacity-building efforts in developing country Parties support the implementation of the Paris Agreement and all its long-term goals. In particular, capacity-building efforts aim to increase the ability to foster climate resilience. and low GHG emissions development (Article 2, para.1(b)).

14. In this context, some progress has been made on enhancing the capacity of developing country Parties at the systemic, institutional and individual levels for implementing the Paris Agreement. Developing countries have increasingly developed and refined policies, regulatory frameworks, laws, institutional capacities, technical skills and knowledge for adaptation and mitigation action and transparency. Progress in enhancing institutional capacity has focused on the capabilities and performance of institutions and their ability to adapt to change and to cooperate with one another as well as on individual capacity on knowledge and skills development, including for effective participation, knowledge exchange, and behavioural change

15. Progress has been achieved through the enhanced support provided for capacity-building by developed countries, South–South cooperation, and endogenous resources of developing countries, as well as by bodies established under the Convention that serve the Paris Agreement, including the PCCB.

16. Since the entry into force of the Paris Agreement, developed country Parties have reported the provision of enhanced support for capacity-building, as reflected in the increasing number of activities reported in their BRs. The 686 capacity-building activities reported in their latest BRs represent an increase of more than 77 per cent compared with the previous reporting period. The majority of reported activities were focused on building capacity for adaptation, mainly in the areas of agriculture, infrastructure and water. To a lesser extent, capacity-building activities were focused on mitigation, mostly in the area of energy, forestry and MRV. Most of the capacity-building activities supported by developed country Parties were implemented in the African and Asia-Pacific regions. However, trends in support for capacity-building can only be taken as indicative, given that comprehensive and comparable data in this regard remains unavailable, as developed country Parties continue to apply different approaches for reporting on support provided for capacity-building.

17. Despite the progress made on enhancing the capacity of developing country Parties, many developing country Parties continue to face significant capacity gaps and have urgent needs for enhancing capacity at the national, subnational and local levels to implement the Paris Agreement. Most developing country Parties identified capacity-building as a prerequisite for achieving their NDC targets, with many specifying capacity-building needs for formulating policies, integrating mitigation and adaptation into sectoral planning processes, accessing finance, and generating and providing the necessary information for clarity, transparency and understanding of NDCs.

II. Introduction

A. Mandate

18. This section provides an overview of the various provisions contained in the Paris Agreement and relevant decisions which form the mandate for the collection and synthesis of information contained in this report.

19. In decision 19/CMA.1, paragraph 23 (d), the CMA requested the secretariat, under the guidance of the co-facilitators, to prepare for the technical assessment a synthesis report on the information identified in its paragraph 36(d). In paragraph 36(d), the CMA decided that the sources of input for the global stocktake will consider information at a collective level on the finance flows, including the information referred to in Article 2, paragraph 1(c), of the Paris Agreement, and means of implementation and support and mobilization and

provision of support, including the information referred to in the Paris Agreement, in Article 9, paragraphs 4 and 6, Article 10, paragraph 6, Article 11, paragraph 3, and Article 13, in particular paragraphs 9 and 10. This should include information from the latest BA of the SCF.

20. Article 9, paragraph 4 of the Paris Agreement sets out that the provision of scaled-up financial resources should aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies, and the priorities and needs of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change and have significant capacity constraints, such as the LDCs and SIDS, considering the need for public and grant-based resources for adaptation.

21. Article 9, paragraph 6 of the Paris Agreement provides that the global stocktake referred to in its Article 14 shall take into account the relevant information provided by developed country Parties and/or Agreement bodies on efforts related to climate finance.

22. Article 2, paragraph 1(c) of the Paris Agreement provides that, in enhancing the implementation of the Convention, including its objective, the Agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development.

23. Article 10, paragraph 6 of the Paris Agreement stipulates that support, including financial support, shall be provided to developing country Parties for the implementation of this Article, including for strengthening cooperative action on technology development and transfer at different stages of the technology cycle, with a view to achieving a balance between support for mitigation and adaptation. It further states that the global stocktake referred to in Article 14 shall take into account available information on efforts related to support on technology development and transfer for developing country Parties.

24. Article 11, paragraph 3 of the Paris Agreement states that all Parties should cooperate to enhance the capacity of developing country Parties to implement this Agreement, and that developed country Parties should enhance support for capacity-building actions in developing country Parties.

25. Article 11, paragraph 4 of the Paris Agreement stipulates that all Parties enhancing the capacity of developing country Parties to implement this Agreement, including through regional, bilateral and multilateral approaches, shall regularly communicate on these actions or measures on capacity-building. Developing country Parties should regularly communicate progress made on implementing capacity-building plans, policies, actions or measures to implement this Agreement. In terms of reporting requirements for Parties under the Paris Agreement, Article 13, paragraph 9 sets out that developed country Parties shall, and other Parties that provide support should, provide information on financial, technology transfer and capacity-building support provided to developing country Parties under Articles 9, 10 and 11. Article 13, paragraph 10 states that developing country Parties should provide information on financial, technology transfer and capacity-building support needed and received under Articles 9, 10 and 11.

26. In line with Article 9, paragraph 7 of the Paris Agreement, developed country Parties shall provide transparent and consistent information on support for developing country Parties provided and mobilized through public interventions biennially in accordance with the modalities, procedures and guidelines to be adopted by CMA 1, as stipulated in Article 13, paragraph 13. Other Parties are encouraged to do so.

B. Scope

27. This report aims to provide information to support the assessment of the progress made in achieving the purpose of the Paris Agreement and its long-term goals, including with regard to the issue of support. The detailed provisions identified in decision 19/CMA.1, paragraphs 23 (d) and 36 (d) having been outlined in the introduction above; the elements contained the Paris Agreement relevant for finance, technology, and capacity-building are outlined below.

1. Elements under the Paris Agreement related to finance, technology and capacity-building

28. This section provides an overview of the relevant provisions contained in the Paris Agreement and relevant decisions taken by the COP pertaining to finance, technology and capacity-building.

29. As outlined above, Article 2, paragraph 1(c) of the Paris Agreement states that, in enhancing the implementation of the Convention, including its objective, the Agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development.

30. Article 9 contains provisions pertaining to the following:

(a) Paragraph 1 provides that developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention;

(b) Other Parties are encouraged to provide or continue to provide such support voluntarily, as per Article 9, paragraph 2;

(c) Paragraph 3 states that, as part of a global effort, developed country Parties should continue to take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels, noting the significant role of public funds, through a variety of actions, including supporting country-driven strategies, and taking into account the needs and priorities of developing country Parties. Such mobilization of climate finance should represent a progression beyond previous efforts;

(d) Paragraph 4 states that the provision of scaled-up financial resources should aim to achieve a balance between adaptation and mitigation, taking into account country-driven strategies, and the priorities and needs of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change and have significant capacity constraints, such as the LDCs and SIDS, considering the need for public and grant-based resources for adaptation;

(e) In line with paragraph 5, developed country Parties shall biennially communicate indicative quantitative and qualitative information related to paragraphs 1 and 3 of the Article, as applicable, including, as available, projected levels of public financial resources to be provided to developing country Parties. Other Parties providing resources are encouraged to communicate biennially such information on a voluntary basis.

31. Decision 1/CP.21, paragraph 53 states that, in accordance with Article 9, paragraph 3 of the Paris Agreement, developed countries intend to continue their existing collective mobilization goal through 2025 in the context of meaningful mitigation actions and transparency on implementation. Furthermore, it was decided that, prior to 2025 the CMA shall set a new collective quantified goal from a floor of USD 100 billion per year, taking into account the needs and priorities of developing countries. At CMA 3, Parties decided to initiate the deliberations on setting a new collective quantified goal, with a view to concluding the deliberations by setting the new collective quantified goal in 2024.[12]

32. The Paris Agreement includes provisions that call for transparent and consistent information on financial support (in the context of Article 9 on finance) as part of the enhanced transparency framework (established in Article 13 on transparency), which will build on and enhance the existing arrangements under the Convention. Furthermore, Article 13 stipulates that the purpose of the framework for transparency of support is to provide clarity on support provided and received by relevant individual Parties and, to the extent possible, to provide a full overview of financial support provided in order to inform the global stocktake.

[12] Decision 9/CMA.3, paras 1 and 22.

33. Article 10, paragraph 1 of the Paris Agreement states that Parties share a long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce GHG emissions.

34. Article 10 of the Paris Agreement further contains the following provisions on technology development and transfer:

(a) Paragraph 2 states that Parties, noting the importance of technology for the implementation of mitigation and adaptation actions under this Agreement and recognizing existing technology deployment and dissemination efforts, shall strengthen cooperative action on technology development and transfer;

(b) Paragraph 5 states that accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development. Such effort shall be, as appropriate, supported, including by the Technology Mechanism and, through financial means, by the Financial Mechanism of the Convention, for collaborative approaches to research and development, and facilitating access to technology, in particular for early stages of the technology cycle, to developing country Parties;

(c) Paragraph 6 states that support, including financial support, shall be provided to developing country Parties for the implementation of this Article, including for strengthening cooperative action on technology development and transfer at different stages of the technology cycle, with a view to achieving a balance between support for mitigation and adaptation.

35. Article 11, paragraph 1 stipulates that capacity-building under this Agreement should enhance the capacity and ability of developing country Parties, in particular countries with the least capacity, such as the LDCs, and those that are particularly vulnerable to the adverse effects of climate change, such as SIDS, to take effective climate change action, including, inter alia, to implement adaptation and mitigation actions, and should facilitate technology development, dissemination and deployment, access to climate finance, relevant aspects of education, training and public awareness, and the transparent, timely and accurate communication of information.

36. Article 11, paragraph 2 notes that capacity-building should be country-driven, based on and responsive to national needs, and foster country ownership of Parties, in particular, for developing country Parties, including at the national, subnational and local levels. Capacity-building should be guided by lessons learned, including those from capacity-building activities under the Convention, and should be an effective, iterative process that is participatory, cross-cutting and gender-responsive.

37. Article 11, paragraph 3 states that all Parties should cooperate to enhance the capacity of developing country Parties to implement this Agreement and that developed country Parties should enhance support for capacity-building actions in developing country Parties.

38. Article 11, paragraph 4 offers provisions on reporting on progress on capacity-building under the Agreement, stating that all Parties enhancing the capacity of developing country Parties to implement this Agreement, including through regional, bilateral and multilateral approaches, shall regularly communicate on these actions or measures on capacity-building. Developing country Parties should regularly communicate progress made on implementing capacity-building plans, policies, actions or measures to implement this Agreement.

39. Article 11, paragraph 5 provides for institutional arrangements on capacity-building, stating that capacity-building activities shall be enhanced through appropriate institutional arrangements to support the implementation of this Agreement, including the appropriate institutional arrangements established under the Convention that serve this Agreement. It also states that CMA 1 shall consider and adopt a decision on the initial institutional arrangements for capacity-building. Following these provisions, CMA 2 adopted decision 3/CMA.2 on initial institutional arrangements for capacity-building under the Agreement, deciding that

the PCCB shall serve the Paris Agreement in accordance with the its mandate as defined by the COP.[13]

2. Relationship between Article 2, paragraph 1(c), and Article 9 of the Paris Agreement

40. The Paris Agreement does not define a relationship between its Article 2, paragraph 1(c), and Article 9. However, concepts included in Article 2, paragraph 1(c), are referred to in subsequent CMA decisions which relate to Article 9, such as decision 12/CMA.1 on identification of the information to be provided by Parties in accordance with Article 9, paragraph 5, of the Paris Agreement, and decision 14/CMA.1 on setting a new collective quantified goal on finance in accordance with decision 1/CP.21, paragraph 53. Most recently, in decision 9/CMA.3, paragraph 15, Parties decided that the new collective quantified goal aims at contributing to accelerating the achievement of Article 2 of the Paris Agreement of holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change; increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low GHG emissions development in a manner that does not threaten food production; and making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development.

41. Some Parties, in their biennial communication pursuant to Article 9, paragraph 5 of the Paris Agreement on indicative quantitative and qualitative information related to paragraphs 1 and 3 of the Article, outlined the ways in which supporting developing countries in meeting the Paris Agreement goals through capacity-building and technical assistance for fiscal and macroeconomic policymaking will help them identify and mobilize domestic resources for climate action and attract international climate finance that can fulfil their investments needs. In this context, it was noted that Article 9 and Article 2, paragraph 1(c), are neither interchangeable nor mutually exclusive but reinforce each other.[14]

42. Few national governments have framed the actions related to making finance flows consistent to low GHG emission and climate-resilient development including the development of taxonomies, disclosure frameworks, fiscal support regimes and exclusion policies, as direct responses to Article 2, paragraph 1(c). Developing countries largely emphasize their ability to access international climate finance in the context of Article 9, as well as directing domestic finance flows to achieving NDC goals.[15]

43. The mapping exercise of the fourth BA showed how actors that are typically involved in climate finance flows under Article 9, such as bilateral agencies, development finance institutions, multilateral climate funds and MDBs, are also adopting measures/activities on aligning with the Paris Agreement and/or being consistent with Article 2, paragraph 1(c). Such efforts also include scaled-up provision and mobilization of climate finance as part of "alignment" efforts.

3. Contextual information on the scale of climate finance and investments and means of implementation needed

44. The needs identified and articulated by developing country Parties across adaptation communications, BURs, LEDS, NAPs, NAPAs, NCs, NDCs, TAPs and TNAs submitted to the UNFCCC encompass a wide range of financial, technology development and transfer, and capacity-building needs. The level of detail provided varies in terms of the description

[13] Decision 1/CP.21, para. 71 and decision 9/CP.25, para. 9.

[14] See UNFCCC SCF. 2021b. *Fourth (2020) Biennial Assessment and Overview of Climate Finance Flows Technical Report*. Bonn: Germany. para. 487. Available at https://unfccc.int/sites/default/files/resource/54307_1%20-%20UNFCCC%20BA%202020%20-%20Report%20-%20V4.pdf.

[15] See UNFCCC SCF. 2021b. *Fourth (2020) Biennial Assessment and Overview of Climate Finance Flows Technical Report.* Bonn: Germany. para. 488. Available at https://unfccc.int/sites/default/files/resource/54307_1%20-%20UNFCCC%20BA%202020%20-%20Report%20-%20V4.pdf.

of needs and their associated costs, if specified. While some Parties express costed needs for adaptation or mitigation purposes, others communicate needs at the activity or sector level.

45. The first NDR[16] prepared by the SCF provides an overview of qualitative (hereinafter referred to as needs) and quantitative information (hereinafter referred to as costed needs) on the basis of available data and evidence from reports at the national, regional and global level. As such, the first NDR does not constitute an assessment of the needs of developing country Parties: the numbers of reported and costed needs are higher in the reports of some countries than of others. This does not imply that the latter have no or fewer needs; rather, this may be due to the lack of available data, tools and capacity for determining and costing needs.

46. COP 26 and CMA 3 noted that NDCs from 153 Parties included 4,274 needs, with 1,782 costed needs identified across 78 NDCs, cumulatively amounting to USD 5.8–5.9 trillion up until 2030, and that, although developing country Parties identified more adaptation needs than mitigation needs, more costs were identified for the latter, which may not imply that mitigation needs are greater but rather that there is a lack of available data, tools and capacity for assessing adaptation needs.[17]

47. In addition to the needs outlined by Parties, various sources of information provide an indication of the overall scale of climate finance and investments and means of implementation needed to achieve the goals of the Paris Agreement, with these ranges being subject to various scenarios and projections (see also paras. IV.A.4(b)120–IV.A.4(b)124 below). For example, in its Special Report *Global Warming of 1.5 ºC*, the IPCC stated that global model pathways limiting global warming to 1.5 °C are projected to involve the annual average investment needs in the energy system of around 2.4 trillion USD2010 between 2016 and 2035.[18] In addition, the *World Energy Outlook 2021* of the International Energy Agency suggests that clean energy transition related investment would need to accelerate to around USD 4 trillion annually by 2030 in order to achieve net zero emissions by 2050 globally.[19] The contribution of Working Group III to the forthcoming IPCC Sixth Assessment Report will also include a chapter on investment and finance, providing, inter alia, information on scenarios of and needs for investment and financial flows related to mitigation pathways and climate change action at the global and regional levels, and in developing countries.[20] Other examples include regional and global reports, which also contain information and data on the needs of developing countries. For the mitigation needs of developing countries, these reports use a mix of climate economic modelling for scenarios of below 2 °C, ranging from USD 2.4 to 4.7 trillion in annual energy-related investment needs globally. For adaptation, costs based on bottom-up national and sector-based studies (ranging from USD 140 to 300 billion annually by 2030) measuring impacts to GDP (for example ranging from USD 289.2 to 440.5 billion up to 2030 in Africa) and the incremental investment needed to upgrade or retrofit infrastructure stock (ranging from USD 11 to 670 billion in annual incremental costs) are most prevalent. Furthermore, reports based on energy–economy models note that developing country regions have the largest investment gaps compared with historical trends to achieving climate scenarios in line with the Paris Agreement, with three- to fourfold increases of investment being required in both renewable energy and energy efficiency across many regions that include developing countries. Further information on the issue of investment needs can be found in the first NDR.

48. Financial flows and stocks in GHG-intensive activities remain worryingly high, with fossil fuel investments amounting globally to USD 977 billion in 2017–2018, while fossil fuel subsidies amounted to USD 472 billion in 2018. At the same time, fossil fuel corporate capital expenditure at risk of becoming stranded amounted to USD 50 billion in 2018, while investments with deforestation risks amounted to USD 43.8 billion in 2017–2018, and net

[16] Decision 4/CP.24, para. 13 requested the SCF to prepare, every four years, a report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement, for consideration by the COP, starting at COP 26 and CMA 3. In line with this mandate, the first NDR is available at https://unfccc.int/documents/307595.

[17] Decision 10/CMA.3 and 5/CP.26, para. 12.

[18] See https://www.ipcc.ch/sr15/chapter/spm/, para. D.5.3.

[19] See https://www.iea.org/reports/world-energy-outlook-2021/mobilising-investment-and-finance.

[20] See https://www.ipcc.ch/report/sixth-assessment-report-cycle/ and https://www.ipcc.ch/site/assets/uploads/2018/11/AR6_WGIII_outlines_P46.pdf.

agriculture subsidies amounted to USD 619 billion per year on average for 2017–2019. Fixed assets in sectors linked to fossil fuel systems amounted to USD 32 trillion, real estate assets at risk in 2070 amounted to USD 35 trillion, and stranded assets worth USD 20 trillion are at risk out to 2050. Therefore, and given the scale and speed needed for the transformation to low-emission and climate-resilient development pathways, it is critical to consider climate finance flows within the context of broader finance flows. A sole focus on positive climate finance flows would not be sufficient to meet the overarching objectives of the Paris Agreement. This does not mean, however, that broader finance flows must all have explicit beneficial climate outcomes, but points to the need to integrate climate risks into decision-making and avoid increasing the likelihood of negative climate outcomes.

49. Against this background, significant growth in relevant initiatives has been apparent since the Paris Agreement, in particular in coalitions fostering collective commitments on climate action. Activities relevant to Article 2, paragraph 1(c), in many instances, are found in practices, coalitions and initiatives that predate the Paris Agreement itself. While policy and regulatory measures on green finance have been recorded since 1980, there has been a marked increase in such measures since the adoption of the Paris Agreement. More information on this subject matter is contained in the fourth BA and in section III.2 below.

C. Methods and information sources

1. Approach to and sources of information for the preparation of this report

50. The approach taken in this synthesis report considers the relevant aspects and information sources available within and outside the UNFCCC process with regard to finance, technology, and capacity-building, in line with the mandates provided in the relevant provisions for the global stocktake (see section A above).

(a) Finance

51. With regard to the issue of finance, this report draws from available information as reported by Parties in the absence of any agreed tracking framework on either Article 2 paragraph 1(c) or Article 9 of the Paris Agreement. The structure of information provided follows the relevant mandates as outlined in section A above. In line with the mandates outlined in section A, for the finance part of this synthesis report, the following sources of available information were used in the preparation of this report:

(a) The fourth BA of the SCF;

(b) The first NDR of the SCF;

(c) NDCs and related compilation and synthesis reports;

(d) NC, BR and BUR data and related compilation and synthesis reports;

(e) Biennial communications provided by Parties in line with Article 9, paragraph 5 of the Paris Agreement, and the related compilation and synthesis report.

52. In compiling and synthesizing the information for this report relevant to finance, efforts were made to avoid duplications with the information to be provided by the SCF in response to decision 19/CMA.1, paragraph 24. Special consideration was therefore given to the information as provided by Parties in line with the various reporting guidelines under the UNFCCC. Furthermore, the information was compiled and synthesized in line with the guidance provided by the co-facilitators of the Technical Dialogue.

(b) Technology

53. The technology development and transfer part of this synthesis report (section IV.B below) draws on the following sources:

(a) NDCs and related compilation and synthesis reports;[21]

[21] FCCC/PA/CMA/2021/8/Rev.1.

(b) BRs[22] and related compilation and synthesis reports;[23] [24]

(c) TNAs, TAPs[25] and related compilation and synthesis reports.[26]

(c) Capacity-building

54. With regard to capacity-building (section IV. C below), this report synthesizes information contained in the following documents:

(a) Revised synthesis report on NDCs under the Paris Agreement (October 2021);[27]

(b) NDCs under the Paris Agreement;[28]

(c) Compilation and synthesis of fourth BRs of Parties included in Annex I of the Convention;[29]

(d) Compilation and synthesis of third BRs of Parties included in Annex I of the Convention;[30]

(e) Comprehensive reviews of the implementation of the framework for capacity-building in developing countries[31] and in countries with economies in transition;[32]

(f) Annual synthesis reports on the implementation of the framework for capacity-building in developing countries;[33]

(g) Annual compilation and synthesis reports on the capacity-building work of bodies established under the Convention and its Kyoto Protocol;[34]

(h) Annual reports on the Durban Forum on Capacity-building;[35]

(i) BURs of Parties not included in Annex I of the Convention;[36]

(j) NCs of developing country Parties.[37]

55. The information provided in this report is intended to inform the Technical Dialogue, as mandated (see section A above). Furthermore, the Chairs of the subsidiary bodies have issued a non-paper that includes guiding questions for the Technical Dialogue (15 Sep 2021, updated in Feb 2022) which include the following questions relevant for this synthesis report,

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22 Available at: https://unfccc.int/BRs.
23 FCCC/SBI/2020/INF.10 and FCCC/SBI/2020/INF.10/Add.1.
24 FCCC/SBI/2018/INF.8 and FCCC/SBI/2018/INF.8/Add.1.
25 Available at: https://unfccc.int/ttclear/tna/reports.html.
26 FCCC/SBI/2020/INF.1.
27 FCCC/PA/CMA/2021/8/Rev.1.
28 See UNFCCC interim NDC registry at: https://www4.unfccc.int/sites/ndcstaging/Pages/LatestSubmissions.aspx. Only NDCs received between the cut-off date of 12 December 2021 for the preparation of the revised synthesis report on NDCs and the cut-off date of 15 December 2021 for the preparation of this report were considered.
29 FCCC/SBI/2020/INF.10 and FCCC/SBI/2020/INF.10/Add.1.
30 FCCC/SBI/2020/INF.8 and FCCC/SBI/2020/INF.8/Add.1.
31 FCCC/SBI/2019/INF.17.
32 FCCC/SBI/2017/INF.5.
33 FCCC/SBI/2021/3, FCCC/SBI/2020/5, FCCC/SBI/2019/3, FCCC/SBI/2018/5 and FCCC/SBI/2017/3.
34 FCCC/SBI/2021/2 and FCCC/SBI/2021/2/Add.1, FCCC/SBI/2020/2 and FCCC/SBI/2020/2/Add.1, FCCC/SBI/2019/2 and FCCC/SBI/2019/2/Add.1, FCCC/SBI/2018/3 and FCCC/SBI/2018/3/Add.1, and FCCC/SBI/2017/2 and FCCC/SBI/2017/2/Add.1.
35 FCCC/SBI/2021/8, FCCC/SBI/2020/3, FCCC/SBI/2019/11, FCCC/SBI/2018/13, FCCC/SBI/2017/9 and FCCC/SBI/2016/4.
36 As reflected in annual synthesis reports on the implementation of the framework for capacity-building in developing countries.
37 As reflected in annual synthesis reports on the implementation of the framework for capacity-building in developing countries.

which the information provided in this report aims to address, and which readers of this synthesis report may wish to bear in mind when considering this information:[38]

(a) What is the state of current global climate finance flows and the overall progress made towards making the financial flows consistent with the pathways towards low GHG emissions and climate-resilient development, in the light of equity and the best available science (Article 2, para.1(c) of the Paris Agreement)? (See section D below for specific information);

(b) What collective progress has been made towards provision and mobilization of means of implementation, including finance, technology development and transfer and capacity-building? (See section E below for specific information);

(c) What are the barriers and challenges, including finance, technology development and transfer and capacity-building gaps, faced by developing countries? (See section E below for specific information);

(d) What collective progress has been made towards achieving the long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce GHG emissions referred in Article 10, paragraph1 of the Paris Agreement? What is the state of cooperative action on technology development and transfer? (See section E below for specific information);

(e) What progress been made on enhancing the capacity of developing country Parties to implement the Paris Agreement (Article 11, paragraph 3 of the Paris Agreement)? (See section E for specific information).

2. Overview of approaches used in the preparation of available sources of information, including information on definitions, methodologies, data gaps and uncertainties related to the transparency of climate finance

56. This section provides insights into the approaches used in the preparation and communication of information in the available sources of information that this report draws from. Under the Convention, 24 Annex II Parties are required to provide information in their NCs, BRs and CTF tables 7, 7(a) and 7(b) on the financial resources provided to non-Annex I Parties.[39] The other 20 Annex I Parties are required to submit NCs and BRs, but not required to provide information in CTF tables 7, 7(a) and 7(b) on the financial resources provided to non-Annex I Parties. However, many do voluntarily provide such information. An international assessment and review process is conducted with regard to the BRs of Annex I Parties. As a first step, expert review teams are established to assess the completeness of BRs in accordance with the reporting requirements, and a technical review report is prepared for each BR, taking into account the comments of the Annex I Party.[40]

57. As at November 2021, 24 Annex II Parties had submitted BRs and CTF tables. Of the 20 other Annex I Parties that may voluntarily submit information, 13 had provided data on financial support in their CTFs. An in-depth overview of the methodological approaches taken by Parties in submitting information on financial support provided is included in the fourth BA, as well as in the compilation and synthesis of the fourth BRs.

58. The "UNFCCC biennial update reporting guidelines for Parties not included in Annex I of the Convention" state that non-Annex I Parties should provide updated information on financial resources, technology transfer, capacity-building and technical support received from the GEF, Annex II Parties and other Parties that provide support, the GCF and multilateral institutions for activities relating to climate change, including for the preparation

[38] UNFCCC. 2022d. *Guiding questions by the SB Chairs for the Technical Assessment component of the first Global Stocktake. Revised questions, 18 February 2022*. Bonn: Germany. Available at https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf.

[39] Features of the current system of the MRV of support are described in a technical paper prepared by the secretariat, available at http://unfccc.int/sites/default/files/resource/docs/2017/tp/01.pdf.

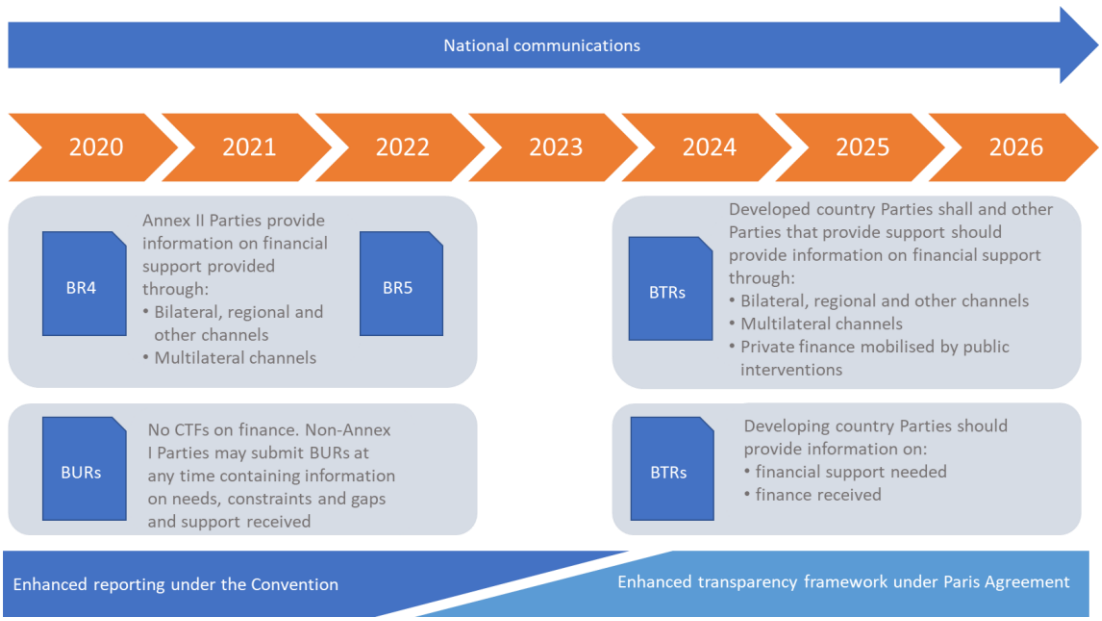
[40] See the UNFCCC guidelines for technical review of information reported under the Convention related to GHG inventories, BRs and NCs of Annex I Parties, in accordance with the reporting requirements contained in decisions 2/CP.17 and 19/CP.18.

of BURs.[41] However, there is no associated common reporting format, and the guidelines do not require information on the underlying assumptions, definitions and methodologies used to generate the information. Limited institutional capacity and resources to track climate finance received, as well as a lack of data, can pose challenges for non-Annex I Parties in reporting this information.

59. According to the fourth BA, 63 non-Annex I Parties had submitted BURs as at December 2020. Not all BURs include information on finance received. A total of 55 non-Annex I Parties have reported on finance received across 86 BUR submissions. An in-depth overview of the scope and coverage of reporting on finance received in BURs is available in the fourth BA.

60. CMA 1 adopted the modalities, procedures and guidelines for developed country Parties to report on the financial support they provide and mobilize and for developing country Parties to report on their finance needs and finance received. Other Parties which provide support should also provide such information and are encouraged to use the same modalities, procedures and guidelines. CMA 3 adopted the CTFs, as applicable, for use when Parties are due to submit their first BTRs under the Paris Agreement in 2024, as well as the definitions of underlying concepts and methodologies used in the reports.

Figure 1
Climate finance reporting with common tabular formats under the Convention and the enhanced transparency framework of the Paris Agreement



Definitional challenges related to climate finance

61. Since the 2014 BA, the SCF has used the following core definition for climate finance to guide the work of the BA, based on a review of the climate finance definitions adopted by data collectors and aggregators, which pointed to a convergence that could be framed as: "Climate finance aims at reducing emissions, and enhancing sinks of GHGs and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts." When determining the amounts to be reported as climate finance, different data providers and aggregators apply their respective operational definitions of climate finance.

62. Operational definitions of climate finance in use generally reflect a common understanding of what is considered mitigation or adaptation finance but differ on the details of sector-specific activities, certain financial instruments and approaches to public and private finance flows. Operational definitions of climate finance in use have evolved over

[41] See annex III to decision 2/CP.17.

time; the MDB list of activities eligible for classification as mitigation finance included charging stations for electric vehicles and hydrogen or biofuel fuelling in 2017 and resource efficiency in aquaculture in 2018, whereas OECD DAC integrated adjustments to adaptation finance eligibility criteria in 2016 to harmonize with a stepwise approach developed by MDBs.

63. The lists of climate mitigation activities developed by MDBs have served in part to inform green or climate-aligned taxonomies in recent years to support the development of the green bond market and regulatory efforts in the field of sustainable finance to combat greenwashing and promote the standardization of financial products. Approaches to defining mitigation and adaptation activities are broadly consistent across various international organizations and regulatory initiatives, although inclusion and exclusion lists and approaches to the criteria used to define such activities can vary.

64. Methodologies to track, estimate and report climate finance vary widely in terms of what is counted, depending on the purpose and scope of the tracking exercise. An overview of key variables used in accounting for climate finance flows, including geographical scope, instruments, points of measurement, is provided in the fourth BA.

65. COP 25 and CMA 2 invited Parties to submit their views on the operational definitions of climate finance for consideration by the SCF in order to enhance its technical work in the context of preparing the fourth BA. Thirteen submissions were received from Parties or Party groupings.[42] A summary of their views is provided below:

(a) Current operational definitions used in the BA: some Parties noted that the current operational definition of climate finance described in the BA reports since 2014 remains valid, aligns with their views or is broad enough to encompass varying definitions in use. The form of the operational definition was also noted, with some Parties mentioning that a single definition would not be useful. Some also indicated that the operational definition was useful, as it was broad enough to cater for the dynamic and evolving nature of the definitions owing to a variety of factors, including:

(i) The way in which the bottom-up approach outlined in the modalities, procedures and guidelines for the enhanced transparency framework will be implemented over time;

(ii) The way in which the need to track progress against the long-term goal in Article 2, paragraph 1(c) of the Paris Agreement will affect the scope of climate finance, with some Parties referring to the global stocktake of collective progress;

(iii) The way in which methodologies and clarifications of definitions will evolve owing to greater data availability over time;

(b) Some Parties pointed to the use of a classification system or taxonomy over a single definition and referred to the development of a taxonomy or classifications external to the UNFCCC process or within their national sustainable finance frameworks;

(c) Other Parties noted how the lack of a common definition impacts the ability to track and assess the fulfilment of obligations of Annex II Parties under the Convention and of developed country Parties under the Paris Agreement. A common definition is needed not only in the context of preparing the BA but also for the overall transparency and effectiveness of the UNFCCC process. This, in turn, could have an impact on the linkage between levels of actions by developing countries and levels of support provided and, ultimately, the achievement of the objectives of the Convention and the Paris Agreement. In this context, two submissions proposed an operational definition, whereas other submissions proposed an operational approach to achieve greater convergence over time, based either on common principles or responses to a common set of questions to provide granular information;

[42] As at October 2020, submissions had been received from the African Group of Negotiators, Alliance of Small Island States, Canada, Environmental Integrity Group, EU, Independent Association of Latin America and the Caribbean, Indonesia, Japan, LEG, Norway, the Philippines, Solomon Islands and Vanuatu. The submissions are available at https://www4.unfccc.int/sites/submissionsstaging/Pages/Home.aspx.

(d) Coverage and scope: the submissions affirmed the focus on mitigation and adaptation objectives in operational definitions of climate finance, while some Parties also included references to finance for loss and damage (e.g. relocation) as one of the thematic areas under climate finance;

(e) Sources of finance: many Parties noted that climate finance may derive from a variety of public or private sources. Some noted that a significant portion of climate finance should derive from public funds and some noted that mobilized climate finance from private sources should be accounted for in a grant-equivalent manner. Some submissions referred to climate finance in both domestic and international contexts, in line with the overall scope of the BA, while several submissions defined climate finance flows as international funding only;

(f) Instruments: most submissions considered a variety of financial instruments as relevant to the operational definitions of climate finance, either by listing them (e.g. grant, equity, concessional loan, guarantee and blended finance) or by making a reference to the bottom-up approach of the modalities, procedures and guidelines, which includes similar instruments. One submission suggested including only grant and concessional finance instruments in a proposed definition, while another submission included a wide variety of instruments but noted that loans should identify the net or grant equivalent contribution once loans are repaid;

(g) New and additional climate finance: several Parties noted, with reference to Article 4, paragraph 3, of the Convention, that climate finance should be incremental in respect of ODA or exclude existing ODA, or should be in addition to the 0.7 per cent of gross national income committed by donors to development finance flows. One submission called for an operational approach to deciding whether and how to account for development aid classified as climate finance by either identifying a suitable baseline to assess what is new and additional funding or taking a formulaic approach to discounting. One Party noted that although there was a need for this differentiation within the context of the UNFCCC negotiations, at the implementation level it was difficult to differentiate climate finance from development finance. Other Parties noted that climate finance needs to be understood in the broader context of implementing the SDGs and the Addis Ababa Action Agenda on development finance and that methodologies to understand how much development finance is dedicated to climate action were improving;

(h) Other factors: many Parties noted the importance of tracking and monitoring climate finance to avoid double counting not only finance flows from provider to recipient countries but also from the national to the subnational levels, and to demonstrate its effectiveness and impact. Others noted how the impact of climate financing should be linked to enhancing implementation of climate policies, regulations and action plans to meet NDC targets. The importance of timely access to climate finance was also mentioned by several Parties.

66. At COP 26 and CMA 3, Parties recognized that there is no multilaterally agreed definition of climate finance, noted the submissions outlined above, which highlighted that some Parties noted how the lack of a common definition impacts the ability to track and assess climate finance, while other Parties mentioned that a single definition would not be useful, and also noted that the operational definitions in use generally reflect a common understanding of mitigation and adaptation finance. Parties further requested the SCF to continue its work on definitions of climate finance, taking into account the submissions received from Parties on this matter, with a view to providing input for consideration by COP 27.[43]

[43] Decision 10/CMA.3 and decision 5/CP.26, paras. 6 and 7.

III. Information related to finance flows pursuant to Article 2, paragraph 1 (c) of the Paris Agreement

1. Information on consistency of finance flows

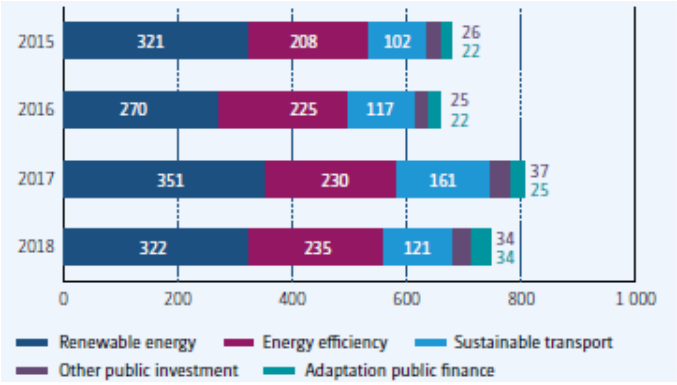
67. This section provides an overview of information available on the long-term goal outlined in Article 2, paragraph 1(c), of the Paris Agreement of making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development

68. Article 2 of the Paris Agreement sets out three interlinked goals aimed at strengthening the global response to climate change in the context of sustainable development and efforts to eradicate poverty: (a) limiting the increase in global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the increase to 1.5 °C above pre-industrial levels; (b) increasing the ability to adapt to and foster resilience against the adverse impacts of climate change; and (c) in paragraph 1(c), making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development. Article 2 states that the Paris Agreement will be implemented to reflect equity, and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

69. The fourth BA provides the most comprehensive overview of global climate finance flows, climate finance trends and their composition. It finds that global climate finance flows were 16 per cent higher in 2017–2018 than in 2015–2016, reaching an annual average of USD 775 billion. Global climate finance estimates increased from USD 692 billion in 2016 to USD 804 billion in 2017 and USD 746 billion in 2018, for an annual average of USD 775 billion in 2017–2018.[44] The growth in 2017 was driven largely by an increase in new private investment in renewable energy as a result of decreasing technology costs, while the decline in 2018 was due primarily to a slowdown in wind and solar investment in major markets. Figure 2 below provides a breakdown of global climate finance flows in 2015–2018 by sector.

Figure 2
Global climate finance flows in 2015–2018

(Billions of United States dollars)

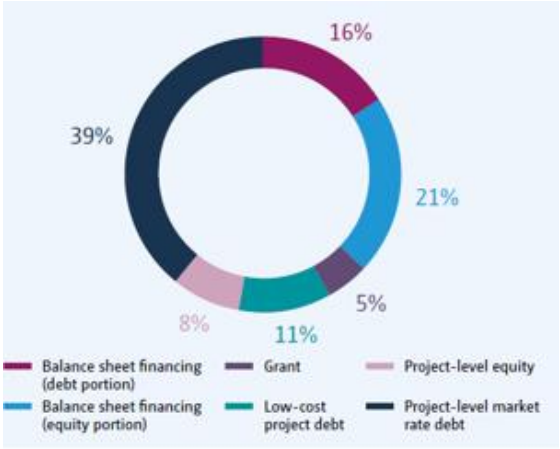


70. Data on financial instruments used are not available for all sources, in particular for the energy efficiency and sustainable transport sectors. Based on the information available on the lower bound estimates of global climate finance flows (i.e. USD 574 billion as the annual average of flows in 2017–2018), project-level market rate debt comprised 39 per cent of the flows (see figure 3 below) followed by balance sheet equity (21 per cent) and balance

[44] For an overview of data quality and completeness on global climate finance estimates, see UNFCCC SCF. 2021b. *Fourth (2020) Biennial Assessment and Overview of Climate Finance Flows. Technical Report.* Bonn: Germany. Available at https://unfccc.int/sites/default/files/resource/54307_1%20-%20UNFCCC%20BA%202020%20-%20Report%20-%20V4.pdf.

sheet debt (16 per cent). Grant finance represented approximately 5 per cent of total global finance flows (Climate Policy Initiative, 2020a).

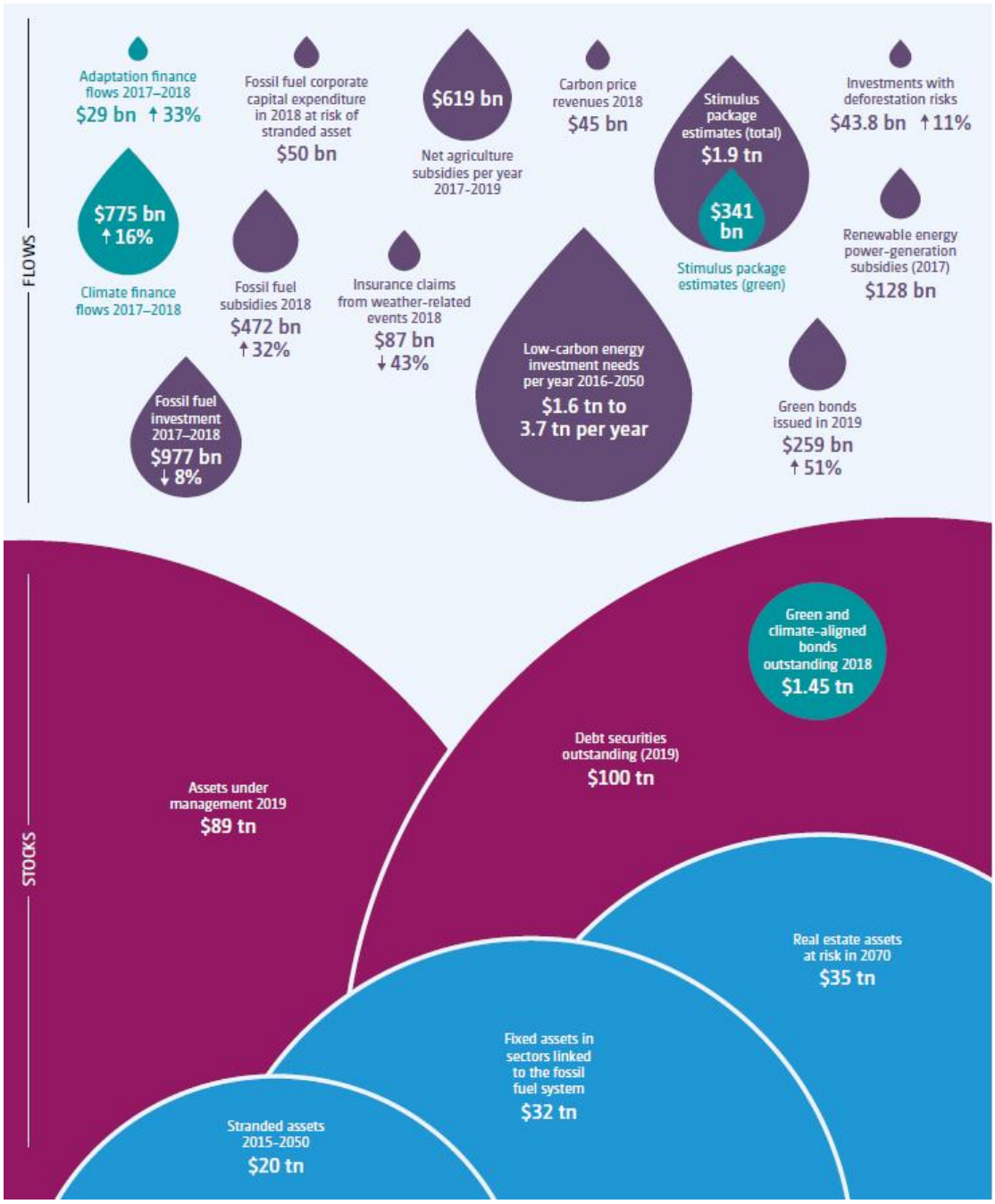
Figure 3
Breakdown of climate finance by financial instrument, 2017–2018



71. Although climate finance flows are increasing, they remain relatively small in the broader context of other finance flows, investment opportunities and costs. Climate finance accounts for just a small proportion of overall finance flows, as shown in figure 4 below. The level of climate finance is considerably below what would be expected in view of the investment opportunities and needs that have been identified. However, although climate finance flows must obviously be scaled up, it is also important to ensure the consistency of finance flows as a whole (and of capital stock) with the long-term goals of the Paris Agreement, specifically those set out in its Article 2.

72. As outlined above, financial flows and stocks in GHG-intensive activities remain worryingly high. Fossil fuel investments amounted globally to USD 977 billion in 2017–2018, while fossil fuel subsidies amounted to USD 472 billion in 2018. Fossil fuel corporate capital expenditure at risk of becoming stranded amounted to USD 50 billion in 2018, while investments with deforestation risks amounted to USD 43.8 billion per year in 2017–2018, and net agriculture subsidies amounted to USD 619 billion per year on average for 2017–2019. Fixed assets in sectors linked to fossil fuel systems amounted to USD 32 trillion, real estate assets at risk in 2070 amounted to USD 35 trillion, and stranded assets worth USD 20 trillion are at risk out to 2050. This highlights the need to ensure that broader finance flows integrate climate risks into decision-making and avoid increasing the likelihood of negative climate outcomes, as otherwise the effectiveness of climate finance flows could be called into question or even negated.

Figure 4
Global climate finance in the context of broader finance flows, opportunities and costs



2. Information on finance sector initiatives related to Article 2, paragraph 1(c), of the Paris Agreement

73. Some Parties have articulated polices and measures in their long-term strategies or domestic policy frameworks that relate to the goal set out in Article 2, paragraph 1(c), of the Paris Agreement. Furthermore, some public and private sector institutions in the financial sector have articulated in their strategies efforts to align with the Paris Agreement and the goal in Article 2, paragraph 1(c).

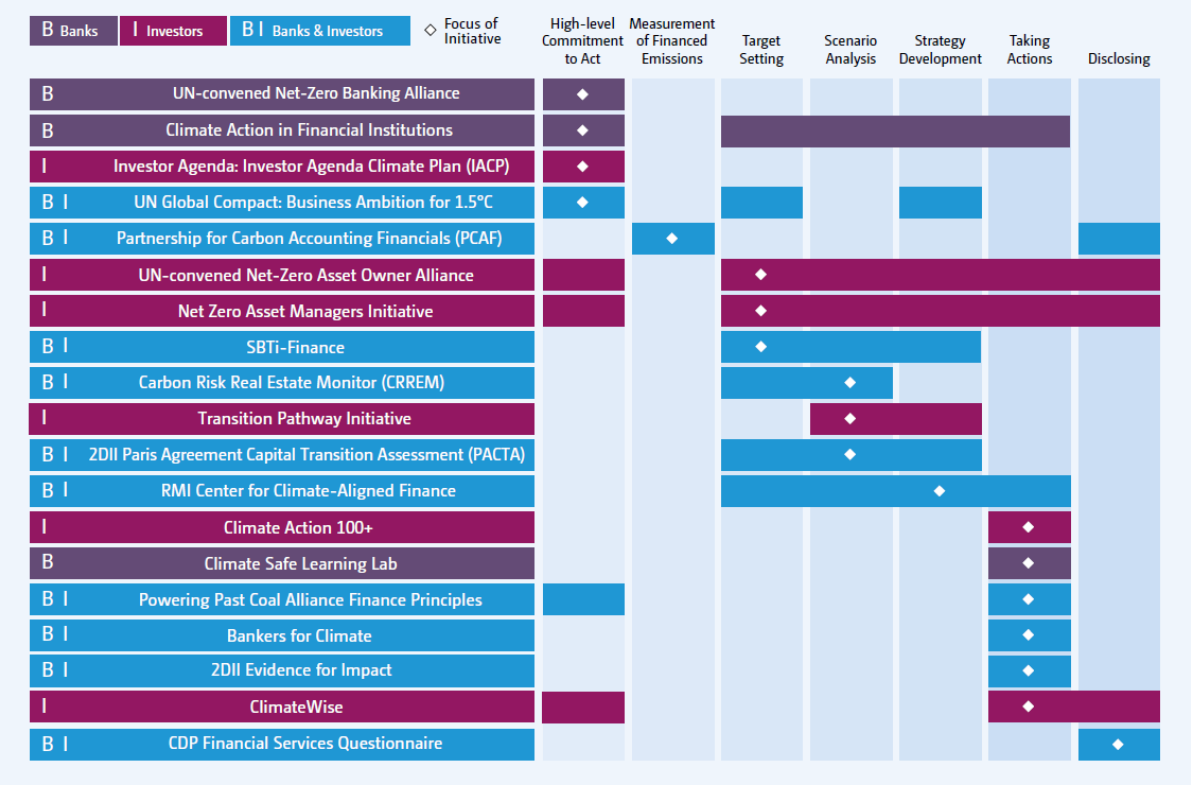
74. As outlined above, there has been significant growth in relevant initiatives since the Paris Agreement entered into force, in particular in coalitions fostering collective commitments on climate action. Activities relevant to Article 2, paragraph 1(c), in many instances, are found in practices, coalitions and initiatives that predate the Paris Agreement.

Policy and regulatory measures on green finance have been recorded since 1980, although there has been a marked increase in such measures since the adoption of the Paris Agreement.

75. The Paris Agreement did, however, lead to existing sustainability and climate-related finance initiatives seeking to adopt objectives or activities that matched those of the Paris Agreement goals. There are at least 115 sustainability- or climate-related financial initiatives that claim to be either directly or indirectly associated with contributing to the goals of the Paris Agreement. The majority relate to promoting new financial instruments that address funding needs for sustainable development and climate change. A smaller pool of approximately 31 initiatives are focused on greening financial systems, for example, the Task Force on Climate-related Financial Disclosures, the EU High Level Expert Group on Sustainable Finance and the Network for Greening the Financial System.

76. Many activities across the stakeholder mapping exercise that explicitly refer to achieving the goals of the Paris Agreement, and Article 2, paragraph 1(c) in particular, are executed through collective initiatives and organizations. This highlights the importance of network effects, knowledge-sharing and common goal setting. In contrast, relatively few relevant actions by national governments are framed in the context of Article 2, paragraph 1(c). In developing countries, the ability to access international climate finance in the context of Article 9 is mentioned, as is directing domestic finance flows towards achieving NDC goals.

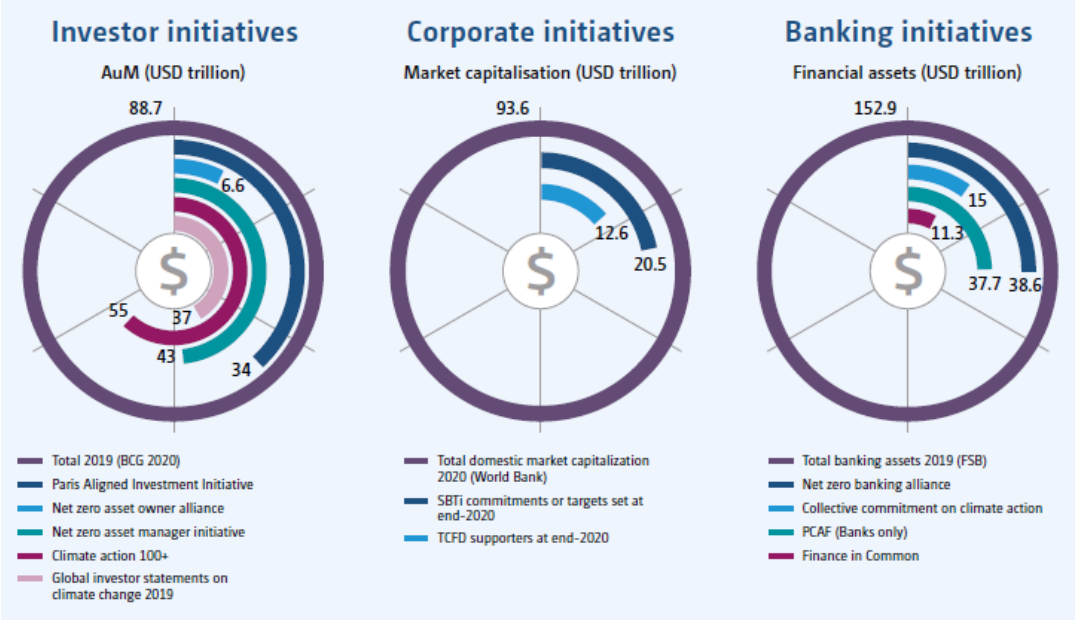
Figure 5
Alliances among private finance flows on climate and sustainability



Source: Partnership for Carbon Accounting Financials. 2021.

Note: UN=United Nations, SBTi=Science-based Targets Initiative, 2DII=2 Degrees Investing Initiative, RMI=Rocky Mountain Institute.

Figure 6
Sustainability- or climate-related financial initiatives



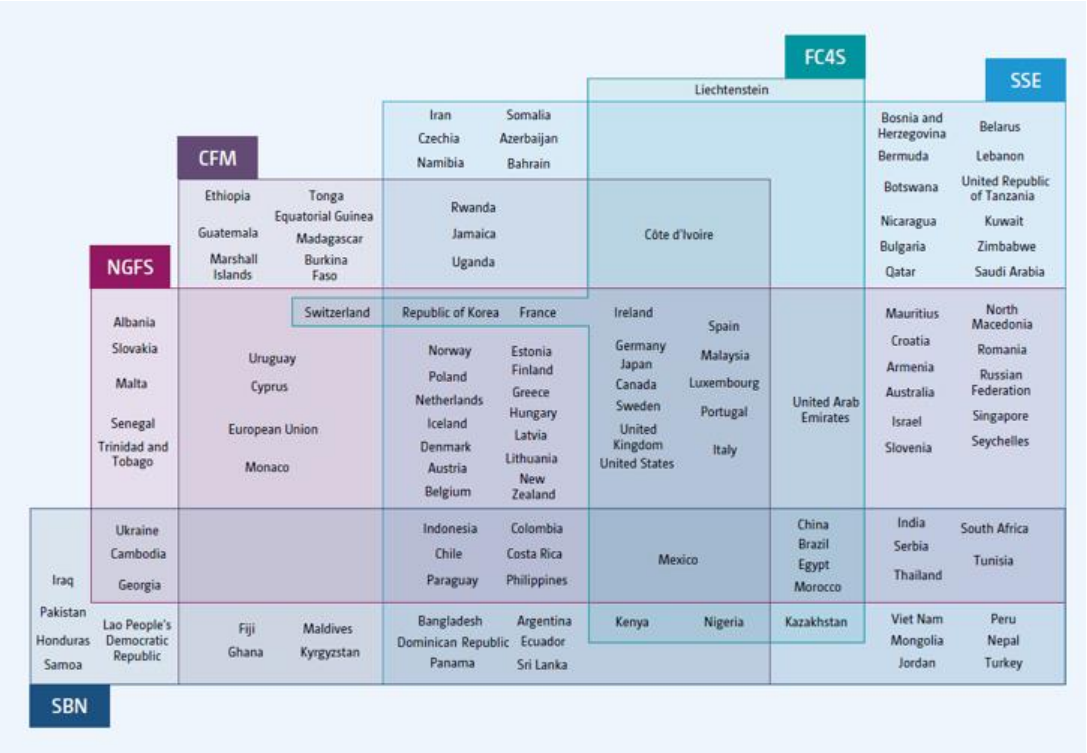
Note: AuM=assets under management, BCG=Boston Consulting Group, SBTi=Science-based Targets Initiative, TCFD=Task Force for Climate-related Financial Disclosures, PCAF=Partnership for Carbon Accounting Financials.

77. Efforts relevant to Article 2, paragraph 1(c), are widespread across all types of actors within the financial sector, including investors, banks and regulators, with actions concentrated on defining their exposure to climate risks and the economic opportunities linked to climate response measures. However, achieving the goal in Article 2, paragraph 1(c), related to low GHG emission and climate-resilient development, set in the context of Article 2, depends on real-economy actions that reduce emissions in line with temperature goals and help to develop climate resilience. Many actors in the financial sector operate at a number of steps removed from real-economy activities, through stock or bond trading, portfolio allocations, or microprudential supervision, which has little direct effect on real-economy investment decisions relative to banks lending to projects, corporations approving capital expenditure plans or governments announcing support incentives. Therefore, measuring the effective role of financial actors in the context of Article 2, paragraph 1(c), is a notable topic of debate among initiatives, including which metrics are most important as indicators of success. The fourth BA found that assessing the real-economy impact and the risk of greenwashing remains a challenge.

78. A number of initiatives relevant to Article 2, paragraph 1(c) include representation from different regions and both developed and developing countries. For private finance actors, such representation is important and it reveals the different relative starting points, capacity and skills gaps that exist within coalitions that make common commitments.

Figure 7

Country representation overlaps among five sustainable finance initiatives, as at end of 2020



Source: UNFCCC SCF, 2021b.

Note: Based on review of membership pages of each organization's website. NGFS=Network for Greening the Financial System, CFM=Coalition of Finance Ministers for Climate Action, FC4S=Financial Centres for Sustainability, SSE=Sustainable Stock Exchanges, SBN=Sustainable Banking Network.

79. Pursuing consistency requires consideration of how finance targeted at GHG-intensive activities can support pathways, as well as elements towards just transitions. A focus on individual financing or investment decisions that are consistent with a pathway towards low GHG emission and climate-resilient development is not straightforward, owing to the significant potential range of pathways that may be followed for achieving the broader goals in Article 2 of the Paris Agreement. The trend towards developing climate, green or sustainable finance taxonomies, as seen across multiple public actor initiatives, can support the identification of activities that are consistent with such pathways, but may risk excluding necessary investment in high-emission sectors or activities that can support the overall transition to such pathways. These may be in areas where activities that are consistent are not yet available at scale owing to slow technological innovation (e.g. steel and cement processes), where activities are needed to enable the transition (e.g. financing of mining activities and road building), or where financing is needed to wind down or responsibly manage the retiring of high-emission activities and transition communities away from their reliance (e.g. coal phase-out policies and subsidies).

80. Transition finance taxonomies and transition bonds are being developed for private actors to finance, for example, transitional activities in the context of financing just transitions, which implies projects that meet certain conditions, such as displacing more carbon-intensive options compared with industry norms; and enabling wider application or integration of less carbon-intensive options.

81. The Paris Agreement also refers to the imperative of implementing the goals through a "just transition of the workforce and the creation of decent and quality jobs". This also applies in the context of implementing Article 2, paragraph 1(c), where some countries such as India and South Africa are developing just transition finance road maps through academic

and financial sector partnerships, aiming to direct future investment towards achieving fair distribution of social and economic benefits.

82. Multilateral efforts that associate climate responses with just transition are also growing. For example, the Climate Investment Funds co-developed the Just Transition Initiative to analyse their investment portfolio and understand the dimensions of just transition by developing knowledge products to encourage engagement, such as the Framework for Just Transition Definitions. Further, the World Bank is supporting a platform initiative to assist coal regions in transition in Ukraine and the Balkans and facilitate experience-sharing with regions that have made the transition to low-carbon energy systems. OECD research highlights just transition related policy options such as carbon pricing, regulations, policies for skills and labour, and accounting for distributional impacts of transition (gender, age and geographically vulnerable communities) (Just Transition Centre, 2017).

83. The principles behind just transition of fairly distributing burdens and benefits is also relevant in the international context and through the references to equity and the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances in Article 2, paragraph 2 of the Paris Agreement. Where countries are economically dependent on fossil fuel industries and energy sources, the policies of trade partners may affect inward investments and/or access for export markets. Further, vulnerabilities to climate impacts may reduce access to capital for countries seen to be most at risk, as better data and awareness of climate-related risks are integrated into investor portfolios. The Vulnerable Twenty Group, for example, offers useful insights and mechanisms on insurance, macrofinancial risks, financial protection, enabling access to affordable finance to grow small and medium-sized businesses, and its climate prosperity plans (MCII/V20, 2020).

84. Further consideration of climate-resilient development pathways is necessary to complement existing approaches. The mapped approaches include a strong focus on actions linked to achieving the goal in Article 2, paragraph 1(a), of the Paris Agreement, namely financing investments related to low GHG emissions, and to mitigating the physical and transition-related risks of shifting from high- to low-emission development trajectories. There appears to be limited evidence of the degree to which financial actors are aligning their investment mandates with climate resilience goals linked to Article 2, paragraph 1(b), of the Paris Agreement. There is a view that focusing on proper climate-related risk disclosure should lead to better, more resilient investment and financing decisions as an end in and of itself, while other views have recognized the existing gaps in guidance and understanding ways to engage in this element.

85. COP 26 and CMA 3 welcomed the mapping of the information relevant to Article 2, paragraph 1(c), of the Paris Agreement in the fourth BA and took note of the key findings of the report, including that banks representing over USD 37 trillion in assets and institutional investors with USD 6.6 trillion in assets have pledged to align their lending and investments with net zero emissions by 2050. Furthermore, Parties were encouraged to ensure that just transition financing is incorporated into approaches to align climate action with the goals of the Paris Agreement.[45]

[45] Decision 5/CP.26, paras. 9 and 10.

IV. Information on provision of means of implementation and mobilization of support

A. Finance

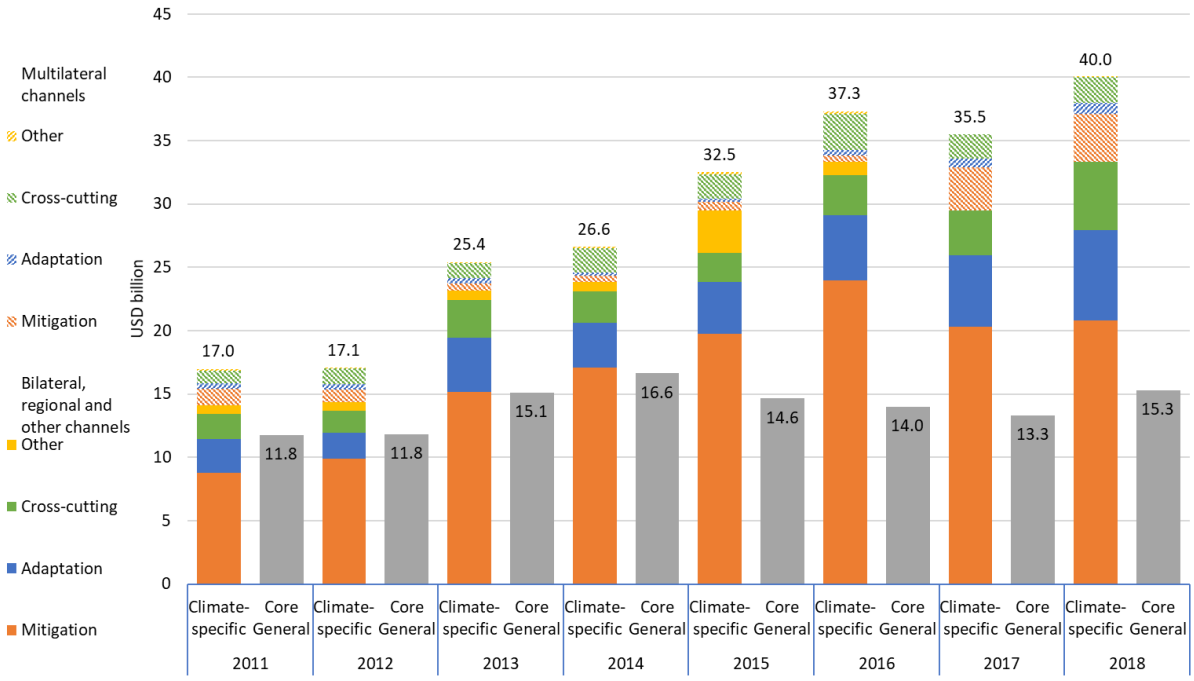
1. Climate finance flows from developed to developing countries

(a) Biennial reports

86. Total public financial support reported by Annex II Parties in their BRs submitted (as at November 2021) amounted to USD 48.8 billion in 2017 and USD 55.3 billion in 2018. The annual average (USD 52.1 billion) represents an increase of 5.7 per cent from the annual average reported for 2015–2016. Climate-specific financial support, which accounts for up to three quarters of the financial support reported in the BRs, increased by 8 per cent to an annual average of USD 37.8 billion. Climate-specific financial support was reported through bilateral, regional and other channels, with USD 29.5 billion in 2017 and USD 33.3 billion in 2018.

87. Mitigation finance constitutes the largest share of climate-specific financial support through bilateral channels at 66 per cent. However, the share of adaptation finance increased from 15 per cent in 2015–2016 to 20 per cent in 2017–2018, as it grew at a higher rate than mitigation finance.

Figure 8
Climate-specific finance and core general funding provided by Parties included in Annex II to the Convention to developing countries, 2011–2018, as reported in their biennial reports
(Billions of USD)



Source: Annex II Party BRs.
Note: Data as of November 2021. "Core general" is support provided to multilateral and bilateral institutions that Parties do not identify as climate-specific. In its BR4, the EU reported climate-specific finance related to the European Investment Bank under multilateral channels and in its BR1–3 under bilateral, regional and other channels.

(b) Multilateral climate funds

88. The fourth BA reports that UNFCCC funds and multilateral climate funds approved USD 2.2 billion and USD 3.1 billion for climate finance projects in 2017 and 2018,

respectively. The annual average for 2017–2018 (USD 2.7 billion) represents an increase of approximately 39 per cent compared with those in 2015–2016, owing primarily to increases in project approvals by the GCF Board and the GEF Council.

89. In terms of inflows to the operating entities of the Financial Mechanism, the seventh replenishment of the GEF resulted in USD 4.1 billion in pledges and USD 802 million allocated to the climate change focal area, compared with USD 4.4 billion in total pledges and USD 1.26 billion allocated to the climate change focal area in the sixth replenishment. The GEF noted the climate co-benefits to other focal areas, including biodiversity and land degradation, with a goal to provide for cross-focal area climate-related finance of at least 60 per cent of total GEF funding commitments over the four-year period. The first replenishment of the GCF Pledging Conference in 2019 amounted to USD 9.8 billion, compared with USD 10.2 billion from the Initial Resource Mobilization Pledging Conference in 2014.

(c) Multilateral development banks

90. The fourth BA reports that MDBs provided USD 34 billion and USD 42 billion in climate finance from their own resources to developing and emerging economies in 2017 and 2018, respectively. The annual average (USD 36.6 billion) across these two years represents a 50 per cent increase since 2015–2016. A variety of approaches may be used to estimate the attribution of climate finance of MDBs to developed countries, with some resulting in a 76 per cent aggregate share and others up to a 90 per cent aggregate share (OECD, 2019a). The attribution of these flows to developed countries is calculated as being between USD 23.3–24.1 billion in 2017 and USD 25.8–28.0 billion in 2018. The technical report on the fourth BA contains an overview of climate finance commitments by MDBs from their own resources that are attributable to Annex II Parties for 2013–2018.[46]

(d) Private climate finance mobilized

91. Data on private finance flows to developing countries remains limited owing to uncertainty of the geographical sources and destinations of flows. As reported in the fourth BA, the OECD estimates that private climate finance mobilized by developed countries through bilateral and multilateral channels amounted to USD 14.5 billion in 2017 and USD 14.6 billion in 2018. During 2016–2018, direct investments in companies and special purpose vehicles mobilized the most private finance (33 per cent of the total), followed by guarantees (31 per cent) and loan syndications (19 per cent). Credit lines, simple co-financing arrangements and investment in funds together accounted for the remaining 20 per cent.

92. The fourth BA also reports that private finance flows from developed to developing countries were USD 5.3 billion in 2017 and USD 11 billion in 2018 (CPI, 2020a). The increase in 2018 was due to a rise in renewable energy and low-carbon transport projects in the emerging markets in Latin America and the Caribbean, Central Asia and Eastern Europe, and sub-Saharan Africa.

93. Information on the recipients of climate finance remains limited. The increase in BUR submissions from non-Annex I Parties has resulted in a greater amount of information on finance received. However, time lags in data availability for reporting make it difficult to provide updated or complete information on finance received in 2017–2018. Of the 63 Parties that had submitted BURs as at December 2020, 28 included some information on climate finance received in 2017 or 2018. In total, USD 7.8 billion was reported in the fourth BA as received for projects starting in 2017 and USD 2 billion for projects starting in 2018. A total of 23 developed country Parties included information on recipients of finance at either the country or project level in their BR4s.

[46] See UNFCCC SCF. 2021b. *Fourth (2020) Biennial Assessment and Overview of Climate Finance Flows. Technical Report*. Bonn: Germany. Table 2.8, p. 76. Available at https://unfccc.int/sites/default/files/resource/54307_1%20-%20UNFCCC%20BA%202020%20-%20Report%20-%20V4.pdf.

2. Thematic distribution of climate finance from developed to developing countries through bilateral and multilateral channels, including information on financial instruments

94. The fourth BA noted that support for mitigation remains greater than support for adaptation. Adaptation finance has remained at between 20 and 25 per cent of committed concessional finance across all sources (noting measurement differences, see table 1 below). However, the continued rise in public climate finance flows contributing towards both adaptation and mitigation complicates this assessment. The rise is most obvious in flows from multilateral climate funds and through bilateral channels. Whereas the GCF allocates climate finance for projects in this cross-cutting category to adaptation or mitigation, not all institutions do so in their programming or reporting. This makes it more difficult to track progress in scaling up adaptation finance and ultimately achieving balance between finance for adaptation and mitigation objectives.

95. Grants continue to be a key instrument for adaptation finance. In 2017–2018, grants accounted for 64 and 94 per cent of the face value of bilateral adaptation finance reported to OECD and of adaptation finance from multilateral climate funds, respectively (see table 1 below). During the same period, 9 per cent of adaptation finance flowing through MDBs was grant-based. These figures indicate no change since 2015–2016. Mitigation finance remains less concessional in nature, with 30 per cent of bilateral flows, 29 per cent of multilateral climate fund approvals and 3 per cent of MDB investments taking the form of grants. These figures, however, may not fully capture the added value brought by combining different types of financial instruments, or technical assistance with capital flows, which can often lead to greater innovation or more sustainable implementation.

Table 1
Characteristics of international public climate finance flows in 2017–2018

	Annual average (USD billion)	*Area of support (percentage)*				*Financial instrument (percentage)*		
		Adaptation	*Mitigation*	*REDD+*[a]	*Cross-cutting*	*Grants*	*Concessional loans*	*Other*
Multilateral climate funds[b]	2.7	20	48	5	27	53	40	8
Bilateral climate finance[c]	29.9	20	66	–	14	64	36	<1
MDB climate finance[d]	39.2	25	75	–	–	5	75	20

Source: UNFCCC SCF, 2021b.

Note: All values based on approvals and commitments.

[a] In decision 1/CP.16, para. 70, COP 16 encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking the following activities: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks.

[b] Including: Adaptation for Smallholder Agriculture Programme, AF, BioCarbon Fund Initiative for Sustainable Forest Landscapes, Clean Technology Fund, Forest Carbon Partnership Facility, Forest Investment Program, GCF, GEF Trust Fund, Global Climate Change Alliance, LDCF, Partnership for Market Readiness, PPCR, SCCF, SREP and United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries.

[c] Bilateral climate finance data are sourced from the BRs of Annex II Parties (that also include regional and other channels) for the annual average and thematic split. The financial instrument data are taken from data from OECD DAC, referring only to concessional flows of climate-related development assistance reported by OECD DAC members. In section C of the summary and chap. III of the technical report, "bilateral finance" refers only to concessional flows of climate-related development assistance reported by OECD DAC members.

[d] The annual average and thematic split of MDBs only includes their own resources, whereas the financial instrument data include data from MDBs and from external resources, owing to the lack of data disaggregation.

3. Geographical distribution

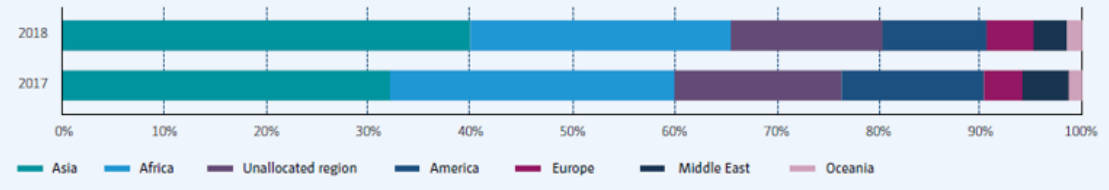
96. With regard to the geographical distribution of public concessional climate finance, Asia remains the principal beneficiary according to the fourth BA. In 2017–2018 the region received on average 30 per cent of funding commitments from bilateral flows, multilateral climate funds and MDBs. Sub-Saharan Africa received an average of 24 per cent of commitments across the sources in the same period, followed by Latin America and the

Caribbean with 17 per cent and the remainder going to the Middle East and North Africa; Central, Eastern and South-Eastern Europe; the South Caucasus; and Central Asia.

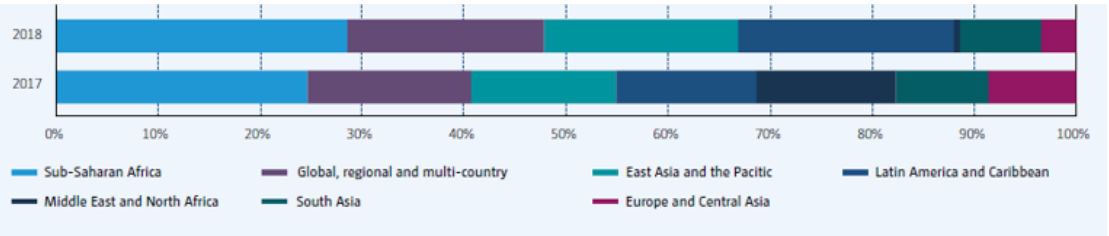
97. The LDCs and SIDS are particularly vulnerable to the adverse effects of climate change. Article 9 of the Paris Agreement emphasizes the importance of the provision of scaled-up financial resources to these countries. In 2017–2018, funding committed to projects in the LDCs represented 22 per cent of bilateral flows and 24 per cent of finance approved through multilateral climate funds. Funding committed to SIDS represented 2 per cent of bilateral finance and 10 per cent of finance approved through multilateral climate funds. Of the finance provided to the LDCs and SIDS, the amount targeting adaptation fell slightly in 2017–2018, although the shares remained stable overall. MDBs channelled 11 per cent of their climate finance to the LDCs and 3 per cent to SIDS. As in previous years, adaptation finance as a share of total climate finance to these countries was significantly higher than that of the overall climate finance spending by MDBs.

Figure 9
Geographical distribution of public climate finance

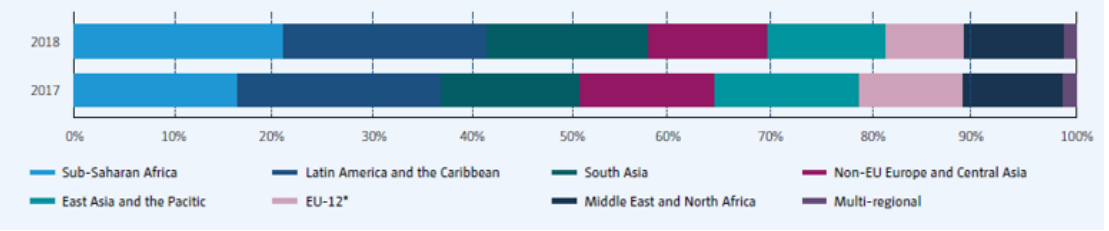
9.1: Geographical distribution of bilateral public climate finance



9.2: Geographical distribution of public climate finance from multilateral climate funds



9.3: Geographical distribution of public climate finance from multilateral development banks



Sources: UNFCCC SCF, 2021b. Author analysis of OECD DAC creditor reporting system statistics, African Development Bank et al, 2014, 2015, 2016, 2017, 2018, 2019, Climate Funds Update, 2020.

4. Country-driven strategies, priorities and needs of developing country Parties

98. As highlighted in the 2021 synthesis report on NDCs, almost all Parties provided information on finance as a means of NDC implementation, with most characterizing finance in terms of international support needed and some mentioning finance in relation to domestic implementation only. Many Parties provided quantitative estimates of financial support needs, which were often expressed as total amounts over the time frame of the NDC. Many provided updated quantitative estimates of financial support needs and some provided estimates for the first time in their new or updated NDCs. Most of those Parties also made efforts to differentiate between quantitative estimates for conditional actions reliant on international support and those for unconditional actions that may be financed from domestic sources. Some Parties provided information on financial support needs across mitigation and

adaptation themes or sectors, and a few provided total estimates. Mitigation finance is needed across renewable energy, energy efficiency, transport and forestry, whereas adaptation finance is needed for activities related to water, agriculture, coastal protection and resilience.[47]

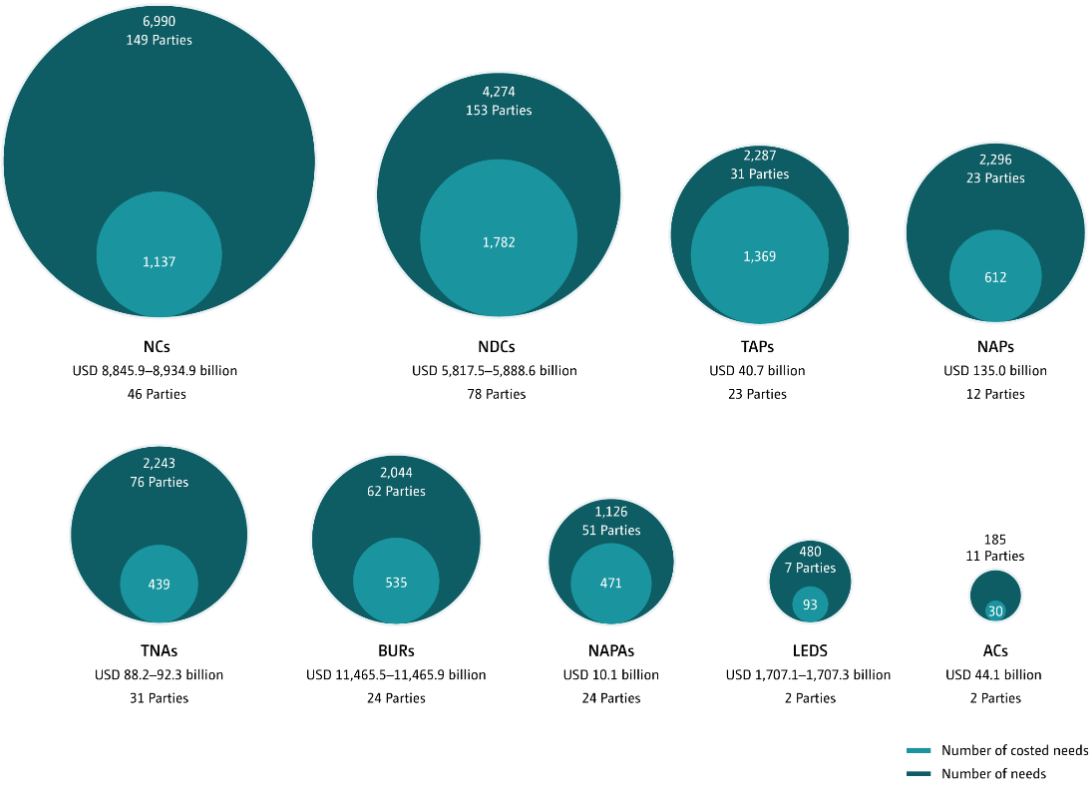
99. The first NDR provides the most comprehensive overview of available information, evidence and data on needs from reports at the national, regional and global level. Needs reported at the national level are compiled from nine reports prepared by developing country Parties and submitted to the UNFCCC, namely adaptation communications, BURs, LEDS, NAPAs, NAPs, NCs, NDC, TAPs and TNAs. Information and data on the needs of developing countries are also available from regional and global reports.

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

(a) Information and data from national reports

(i) Insights from quantitative data on needs

Figure 10
Overview of articulation of needs, including costed needs, by type of national report submitted to the UNFCCC



Source: UNFCCC SCF, 2021a.
Note: Ranges of costs included where available.

[47] FCCC/PA/CMA/2021/8/Rev.1, paras. 194–196.

101. Figure 10 above provides an overview of the articulation of the needs of developing country Parties (outer circles), including overall costed needs (inner circles), across the nine types of national report. The difference between the numbers in the outer and inner circles indicates the number of needs that are not costed. As at 31 May 2021, NDCs from 153 Parties included 4,274 needs, with 1,782 costed needs identified across 78 NDCs, cumulatively amounting to USD 5.8–5.9 trillion up until 2030. Of this amount, USD 502 billion is identified as needs requiring international sources of finance and USD 112 billion as sourced from domestic finance. For 89 per cent of the costed needs, information was not provided on possible sources of finance. Among the national reports, NCs from 149 Parties present the highest number (6,990) of identified needs, of which 1,137 costed needs cumulatively amount to USD 8.8–8.9 trillion, with 5 per cent of the costed needs distributed across 45 NCs and 95 per cent in 1 NC. BURs from 62 Parties indicated 2,044 needs, of which 535 needs are costed, cumulatively amounting to USD 11.5 trillion, with 5 per cent distributed across 60 BURs and 95 per cent across 2 BURs, thereby representing the highest amount of costed needs identified across the nine types of national report (see figure 10 above). These figures should be viewed in the light of the size and nature of the economies of developing country Parties and the scale of climate impacts.[48]

(ii) Thematic distribution of costed needs

Table 2
Overview of sources of reported costed needs of developing countries by type of national report submitted to the UNFCCC

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

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

102. Cumulatively, identified costed mitigation needs tend to be larger than costed adaptation needs across the reports that cover all thematic areas such as BURs, NCs and NDCs (see table 2 above). The overall amount of costed adaptation needs is comparable with the overall amount of costed mitigation needs expressed in NCs (43 and 56–57 per cent, respectively). Although some developing countries provided information on costed needs for mitigation and adaptation by sector and subsector, this information was not provided across

[48] The information provided here is derived from the fourth BA and the first NDR. See UNFCCC SCF. 2021b and UNFCCC SCF. 2021a.

all reports. Therefore, it was not possible to provide a comprehensive and accurate overall amount of costed needs by sector and subsector in the first NDR.

103. Although developing country Parties identified more adaptation than mitigation needs, larger costs were identified for the latter. This may not imply that mitigation needs are greater, but rather be due to a lack of available data, tools and capacity for assessing adaptation needs.

(iii) Regional distribution of costed needs

Table 3
Number and cost of needs expressed in nationally determined contributions by region

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

Note: Ranges of costs included where available.

104. Available information related to costed needs varies across regions (see table 3 above).

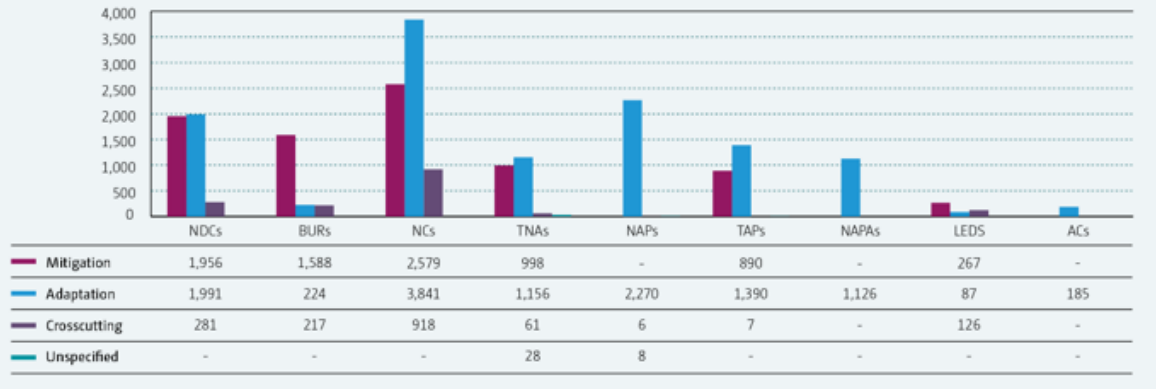
105. Some Parties reported information on potential needs related to averting, minimizing and addressing loss and damage, either through specific adaptation activities that include objectives related to averting, minimizing and addressing loss and damage; referred to damage incurred owing to recent climate-related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

106. Needs expressed in national reports are dynamically changing and may depend on different factors, such as temperature scenarios, mitigation pathways and adaptive capacity, extreme weather events, adverse effects of trade and economic barriers, and social factors such as poverty. Therefore, data and information thereon may not be exhaustive. While the number of needs and costed needs communicated in national reports is lower for some regions than others, this does not mean that those regions have no or fewer needs. Rather, this may be due to a lack of available data, tools and capacity for determining and costing needs. Therefore, the number of needs and costed needs compiled from national reports available at the time of preparation of the first NDR should not be used to draw comparisons of the actual needs across regions.

(iv) Insights from qualitative data on needs

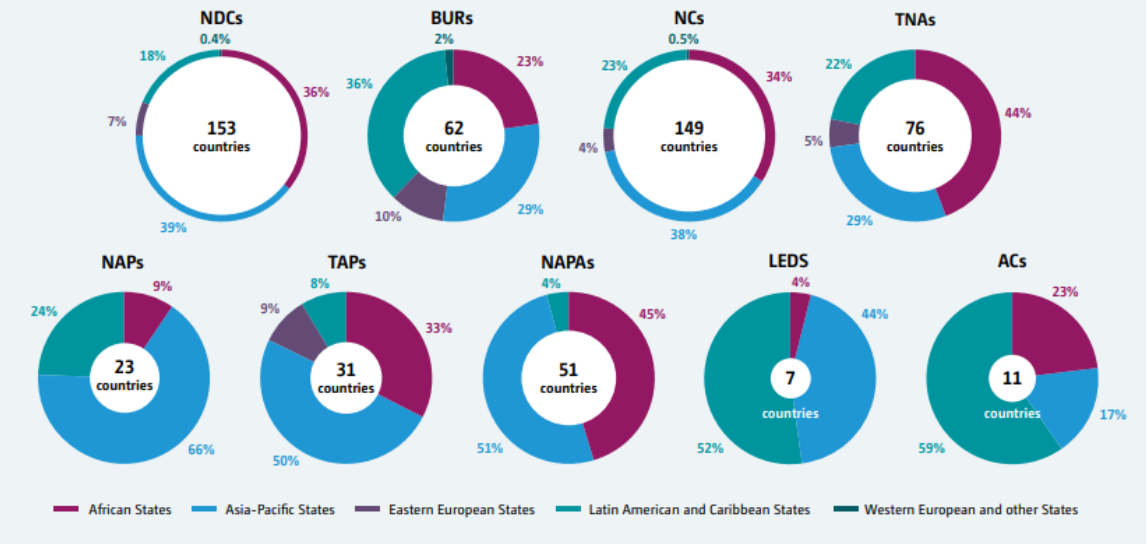
Figure 11
Needs expressed by developing countries in national reports by theme, region and means of implementation

11.1: By theme



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

11.2: By region



11.3: By means of implementation

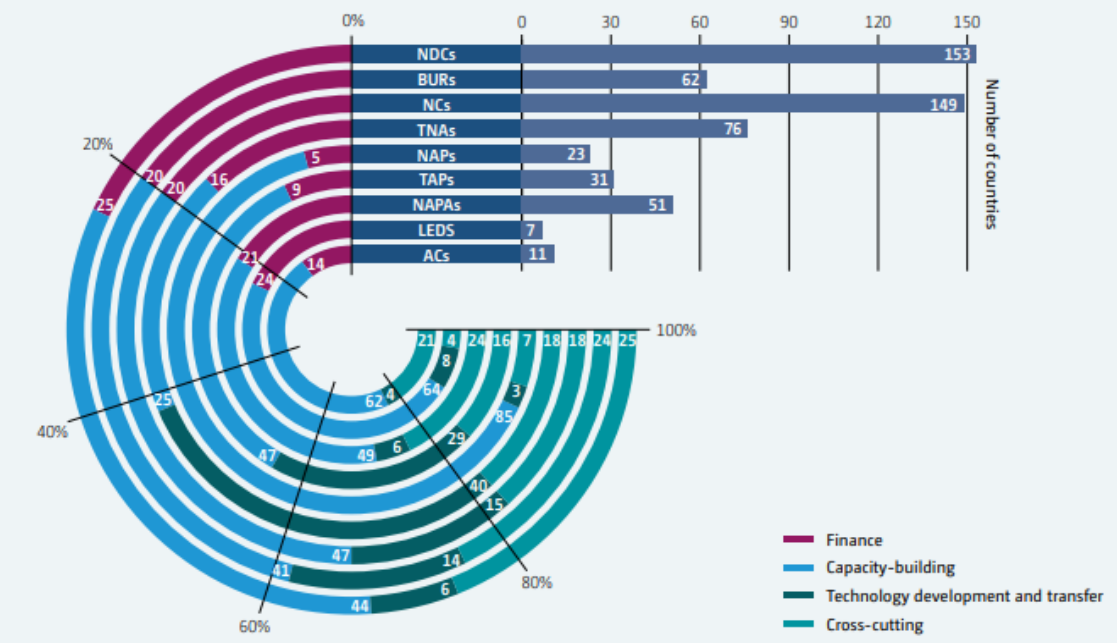
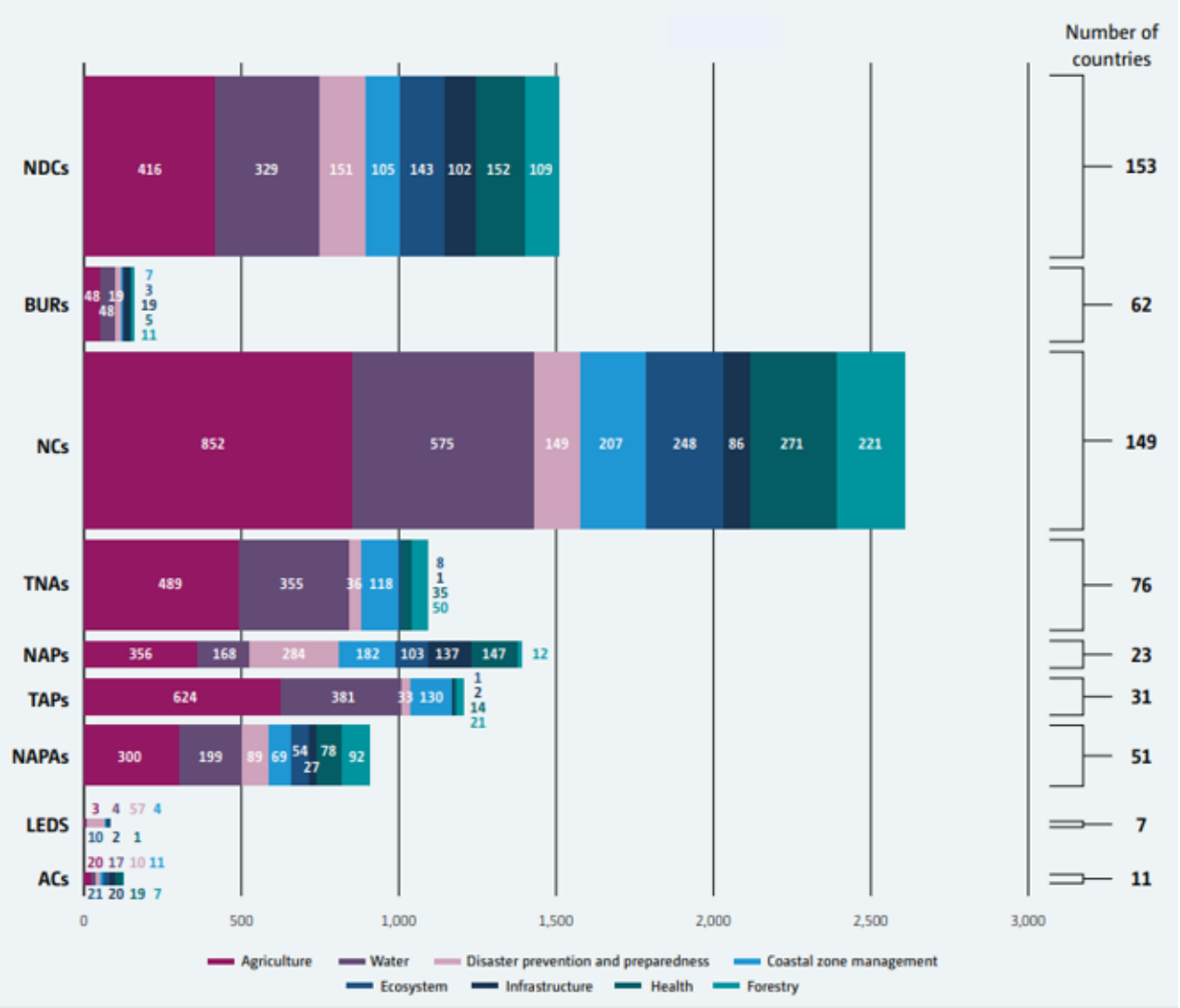


Figure 12
Needs expressed by developing countries in national reports by sector

12.1: Mitigation needs by sector

12.2: Adaptation needs by sector



(v) Thematic distribution

107. Overall, needs related to adaptation are mentioned more often than those related to mitigation in all report types except BURs and LEDS, indicating greater attention to supporting the expressed adaptation needs of developing countries (figure 11.1 above).

(vi) Regional distribution

108. Figure 11.2 above presents the regional distribution of identified needs by report as a percentage. When the number of expressed needs across the nine national report types is considered, developing country Parties in the Africa and Asia-Pacific regions identified comparable numbers of needs across the national reports with broad thematic and sectoral coverage such as BURs, NCs and NDCs, comparable with the Latin America and Caribbean region only in the case of BURs. Developing country Parties in the Asia-Pacific region used NAPs and TAPs to further specify adaptation needs, as more than half of the needs identified in NAPs and TAPs were from this region. Developing country Parties in the Latin America and Caribbean, and Eastern European regions expressed more needs in their NCs than in other national reports.

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

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

(vii) Distribution by means of implementation

111. Qualitative data show a significant prevalence of capacity-building and technology development and transfer needs, which may in part be due to the resources developing countries can access to support the identification of these needs. The number of capacity-building needs was higher than finance needs and technology development and transfer needs identified in the nine national report types except for TNAs (see figure 11.3 above).

(viii) Sectoral and subsectoral distribution

112. On the basis of the number of mitigation needs expressed across the nine national report types, energy is the lead sector for climate change mitigation actions, followed by land use and forestry, transport, agriculture, and waste and sanitation (see figure 12.1 above).

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

114. The majority of expressed mitigation needs in the land-use and forestry sector represented a few densely forested countries. Data in NCs and NDCs showed that, within this sector, needs related to reforestation are the largest needs expressed in financial terms.

115. On the basis of the number of adaptation-related needs expressed across the nine national report types, agriculture and water are the two lead sectors for climate change adaptation actions, followed by disaster prevention and preparedness, coastal zone management and health (see figure 12.2 above).

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

117. Adaptation needs in the water sector are dominated by the need for water distribution infrastructure, water harvesting and irrigation. In NDCs, about 38 per cent of expressed needs in the water sector included financial information. Water distribution infrastructure, including wastewater treatment, was the largest need in financial terms across all types of report.

(ix) Other areas of needs

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

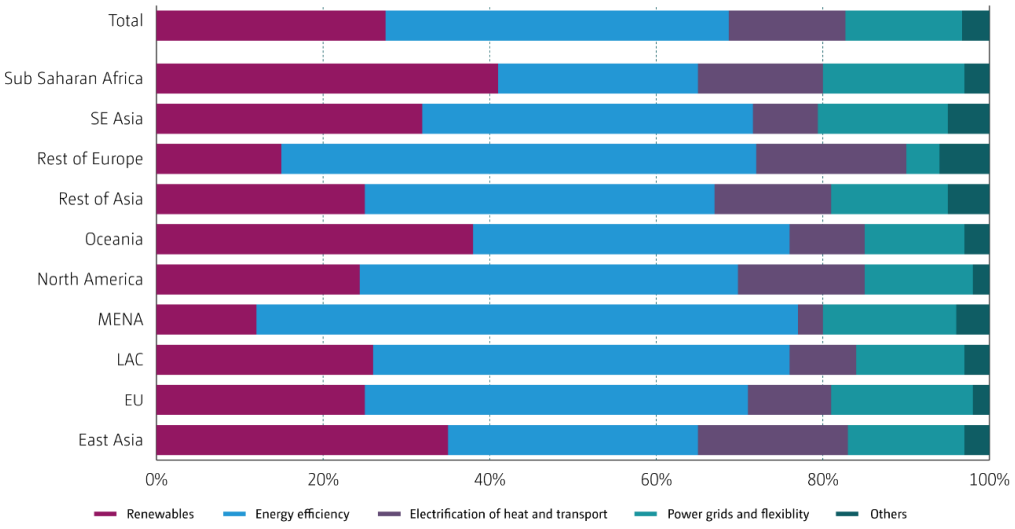
119. Some reports that expressed needs for policy development were linked to the SDGs and the Addis Ababa Action Agenda. In general, the implementation of climate actions is mainstreamed in SDG-related actions. However, a few reports expressed needs focusing on

institution-building and policy development, aiming to link climate commitments with the SDGs.

(b) Information and data from reports by regional and global actors

120. The first NDR also presents available information and data on the needs of developing countries from regional and global reports. For the mitigation needs of developing countries, these reports use a mix of energy–economy and integrated assessment models for scenarios of below 2 °C, ranging from USD 2.4 to 4.7 trillion in annual energy-related investment needs globally (Collum et al, 2018); investment opportunities based on stated national plans and targets including and beyond NDCs, ranging from USD 23.8 to 29.4 trillion for emerging markets from 2016 to 2030 (IFC, 2020); and investment estimates for achieving conditional NDC targets using carbon prices, for example USD 715 billion in Africa (AfDB, 2021) (see figure 13 below for an example of energy investment needs identified by the International Renewable Energy Agency).[49]

Figure 13
Shares of annual average clean energy investments in the International Renewable Energy Agency transforming energy scenario, by region, 2016–2050



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

Notes: (1) SE Asia=South East Asia, MENA=Middle East and North Africa, LAC=Latin America and the Caribbean, EU=European Union; (2) A list of the country classification used in this report is contained in Annex A of UNFCCC SCF, 2021a.

121. Reports based on energy–economy models note that developing country regions have the largest investment gaps compared with historical trends to achieving climate scenarios in line with the Paris Agreement. Three- to fourfold increases of investment are necessary in both renewable energy and energy efficiency across many regions that include developing countries.[50]

122. Regional and global reports also provide estimates related to adaptation and resilience. Costs based on bottom-up national and sector-based studies (ranging from USD 140 to 300 billion annually by 2030) measuring impacts to GDP (for example, ranging from USD 289.2 to 440.5 billion up to 2030 in Africa) and the incremental investment needed to upgrade or

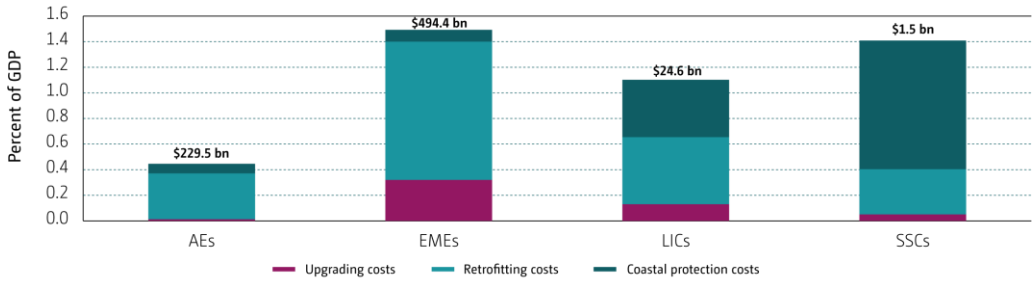
[49] For the purpose of the first NDR, various data sources were used to illustrate needs of developing country Parties, without prejudice to the meaning of this term in the context of the Convention and the Paris Agreement, including but not limited to Parties not included in Annex I to the Convention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

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

retrofit infrastructure stock (ranging from USD 11 billion 670 billion in annual incremental costs) are most prevalent.

123. To make current and future infrastructure climate-resilient, annual costs as a percentage of GDP are at least double in countries with emerging market economies, low-income countries and small States compared with the costs in high-income countries, that is 1.1–1.49 per cent compared with 0.45 per cent. Investment needs expressed as a percentage of GDP for upgrading new infrastructure and coastal protection are proportionally greater in lower-income countries and small States, while retrofitting existing infrastructure is the major cost component in countries with emerging market economies. However, the reports also noted that specific knowledge on the degree of exposure of infrastructure to natural hazards, related to their location, intensity and level of risk, could affect the incremental cost of making infrastructure climate-resilient (e.g. 3 per cent of total investment as opposed to 8–45 per cent) (see figure 14 below).[51]

Figure 14
Public investment needs for resilience of physical infrastructure, by country grouping (gross domestic product weighted average)



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

Note: (1) AE=advanced economies, EMEs=emerging market economies, LIC=low-income countries, SSCs=small-state counties; $=USD, bn=billion; (2) A list of the country classification used in this report is contained in Annex A of UNFCCC, 2021f.

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

5. Challenges and barriers derived from the fourth biennial assessment and overview of climate finance flows and the first Report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement

125. This section provides an overview of information on challenges and barriers as derived from the fourth BA and the first NDR.

126. Ownership of the end use of climate finance flows remains a critical factor in its effectiveness. The broad concept of ownership encompasses the consistency of climate finance with national priorities, the degree to which national systems are used for both spending and tracking, and the engagement of a wide range of stakeholders. Financial needs are being increasingly articulated, but to date lack sufficient comparability of methods, including for costs, time frames and assumptions, in order to make an accurate assessment of the alignment of climate finance provision with such needs. Ministries of finance and planning are strengthening their commitments to engage in climate change planning, with national-level institutions playing a greater role through domestic tracking, monitoring and verification of climate finance.

127. Globally, increasing engagement with climate change can be observed in the ministries responsible for strategic investment and financial management decisions at the

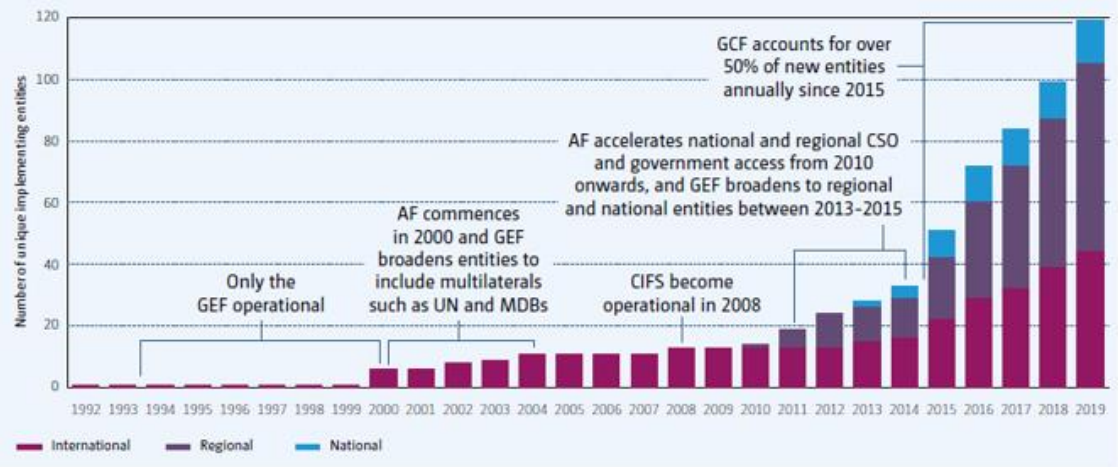
[51] As footnote 51 above.

national level (e.g. ministries of finance, treasuries and ministries of national planning). Engagement in climate finance by a government often manifests itself in the articulation of climate change in the national development agenda and the development of climate change policies, legislative frameworks and strategies, which are evolving rapidly: there are already over 1,860 climate change-relevant laws worldwide.[52]

128. The multilateral climate funds continue to encourage country ownership in their programming. Funds may require a letter of no objection from designated national authorities and some also support broader climate planning policy and processes. The LDCF, for example, has long supported NAPAs and now supports NAPs, which are longer term and are even more integrated into national planning processes, with enhanced potential for national ownership of adaptation actions. The multilateral climate funds are also accrediting more diverse entities: for example, in 2019 the GCF accredited JS Bank Limited, a private sector entity with headquarters in Pakistan, providing microfinance, project finance and commercial banking nationally, and Finance and Business Financial Services Limited in Chile, which promotes financial and commercial advisory services. MDBs and bilateral contributors often also have country partnerships and strategy documents, updated periodically, in order to facilitate country ownership.

129. In 2017–2018, there continued to be a push to diversify modalities of access to climate finance. In a 2019 survey of 105 respondents from 45 developing countries, 73 per cent identified finance from multilateral climate funds as the most challenging source of finance to access compared with private finance (62 per cent), MDBs and development finance institutions (30 per cent) and bilateral sources (17 per cent). Institutions in developing countries are increasingly able to meet fiduciary and environmental and social safeguard requirements for accessing funds. Data show a continued increase in the number of national implementing entities of multilateral climate funds, as well as an increase in the accreditation of civil society and private entities, with both trends largely driven by the GCF. Significant shares of climate finance approvals from multilateral climate funds are programmed through international multilateral accredited and implementing entities (see figure 16 below).

Figure 15
Implementing entities of major multilateral climate funds by scale, 1992–2020



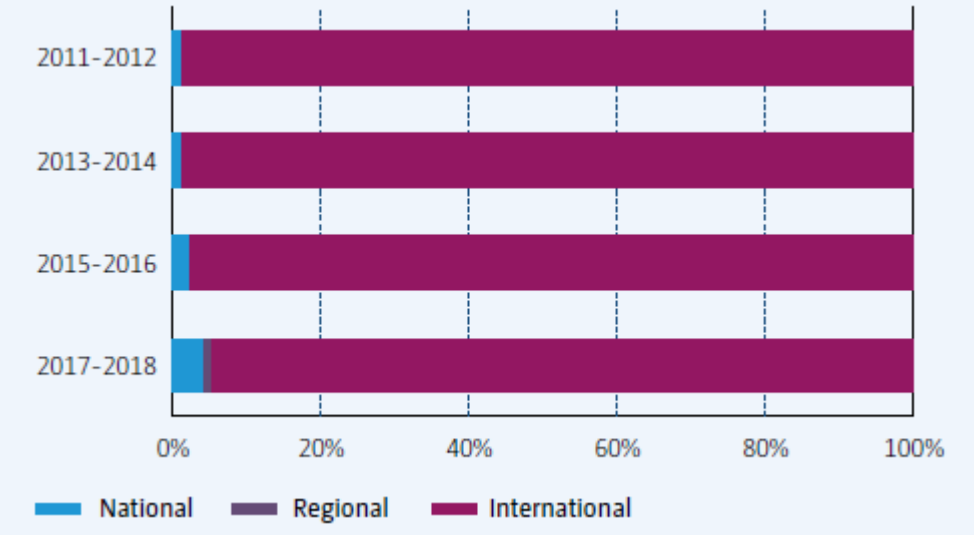
Source: Based on a review of the reports of the relevant multilateral climate change funds, including: AF, Clean Technology Fund, Forest Investment Program, GCF, GEF, LDCF, PPCR, SCCF and SREP.

Note: UN=United Nations, CIFs=Climate Investment Funds, CSO=Civil Society Organisations.

[52] Climate Change Laws of the World database, Grantham Research Institute on Climate Change and the Environment,London School of Economics and Political Science, and Sabin Center for Climate Change Law, Columbia Law School. Available at www.climate-laws.org.

Figure 16

Percentage of climate finance approved from key multilateral climate funds by implementing entity type, 2011–2018



Source: Based on a review of the reports of the relevant multilateral climate change funds, including AF, Clean Technology Fund, Forest Investment Program, GCF, GEF, LDCF, PPCR, SCCF and SREP and SCCF.

130. The capacity of institutions to make strategic choices to use climate finance has long been recognized as important. Both the AF and the GCF have developed readiness programmes, supporting countries in planning for, accessing and delivering climate finance. Together, these funds have approved over USD 285 million in readiness support. The GEF has instead incorporated capacity-building objectives into existing project funding through enabling activities. Reviews of these programmes have endorsed the use of readiness support to build all aspects of the capacity required to mobilize finance for climate action, rather than focusing on supporting access to multilateral climate funds.

131. The below highlights challenges identified by developing country Parties in their national reports to the UNFCCC as described in the first NDR. In general, challenges related to capacity-building needs were frequently identified by developing countries, varying widely from institutional-level capacity to availability of local expertise. Regarding institutional-level capacity, the need to improve intersectoral and intrasectoral coordination for needs identification was highlighted as a significant challenge by the majority of developing countries. The coordination challenge spans from the local to the national level. One of the cited drivers for this was the lack of specialized institutions within line ministries to spearhead climate change actions.

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

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

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

135. Limited institutional capacity for coordinating climate actions, including the needs identification process, across both the public and private sectors, was also identified as a significant challenge. This challenge is compounded by the numerous sectors and institutions that spearhead climate-relevant actions in both the private and public sectors within the complex framework of differentiated governance structures and levels.

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

137. Furthermore, financing arrangements to avert, minimize and address loss and damage, in particular in those developing countries that are most vulnerable to the impacts of climate change, while not commonly understood as a stand-alone area of support, have increasingly become a focus for discussions under the Paris Agreement. In 2016, Parties tasked the secretariat with the preparation of a technical paper elaborating the sources of and modalities for accessing financial support for addressing loss and damage.[53] Parties also requested the secretariat, under the guidance of the WIM Executive Committee and the Chair of the SBI, to organize an expert dialogue to explore a wide range of information, inputs and views on ways to facilitate the mobilization and securing of expertise, and enhancement of support, including finance, technology and capacity-building, for averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, (the Suva expert dialogue) with a view to informing the preparation of a technical paper.[54] The 2016 SCF Forum further explored financial instruments that address the risks of loss and damage associated with the adverse effects of climate change. The Forum discussed four broad financial instruments and tools: (a) risk transfer schemes; (b) catastrophe and resilience bonds; (c) social protection schemes; and (d) contingency finance. It concluded that, although there was a range of approaches for addressing the risks of loss and damage, more work was needed to develop suitable financial instruments.[55] It noted that the types of knowledge, action, support and approaches to address loss or damage, as identified under the WIM to date, vary considerably and are wide in scope. In part, this is because responses cover several domains, including disaster risk management, risk transfer and pooling, contingency and humanitarian measures, adaptation to climate change and climate-resilient development.[56]

138. Support for responding to weather and climate extremes is different in nature to that for slow onset events.[57] Extreme weather events often require rapid pay-outs and can lead to more costly capital, for example, as the frequency and severity of such events increase. Slow onset events, in contrast, point instead to financial protection for the most vulnerable or human displacement. With challenging demarcation and with no commonly agreed definition for loss and damage, significant challenges exist in collecting and aggregating information on finance flows relevant for averting, minimizing and addressing loss and damage.

139. It has emerged that the development and use of financial instruments to avert, minimize and address loss and damage requires greater information and knowledge on climate-related risk and assets at risk, as well as an adequate policy and regulatory environment (Pandit Chhetri et al., 2021). As echoed in the highlights of the 2016 SCF Forum, a holistic and integrated approach is needed, but no one size will fit all, both in the measures taken but especially in the set of financial instruments used to address the risk of

[53] Decision 4/CP.22, para. 2f.

[54] More information available at: https://unfccc.int/topics/adaptation-and-resilience/workstreams/loss-and-damage-ld/workshops-meetings/suva-expert-dialogue#eq-2.

[55] See FCCC/TP/2019/1, available at https://unfccc.int/sites/default/files/resource/01_0.pdf

[56] See the web page of the 2016 SCF Forum at https://unfccc.int/event/2016-forum-standing-committee-finance.

[57] Slow onset events, as identified in decision 1/CP.16, para. 25, include sea level rise, increasing temperatures, ocean acidification, glacial retreat and related impacts, salinization, land and forest degradation, loss of biodiversity and desertification.

loss and damage and the financial and regulatory infrastructure that these instruments will sit within.

140. CMA 3 decided to establish the Glasgow Dialogue between Parties, relevant organizations and stakeholders to discuss the arrangements for the funding of activities to avert, minimize and address loss and damage associated with the adverse impacts of climate change, to take place in the first sessional period of each year of the SBI, concluding at its sixtieth session (June 2024). CMA 3 also requested the SBI to organize the Glasgow Dialogue in cooperation with the WIM Executive Committee,[58] which will provide a synthesis report to the technical assessment component of the global stocktake in line with paragraph 36 of decision 19/CMA.1.[59]

6. Information contained in the biennial communications received in accordance with Article 9, paragraph 5, of the Paris Agreement

141. Recognizing the importance of predictability and clarity of information on financial support for the implementation of the Paris Agreement, CMA 1 requested developed country Parties to submit, starting in 2020, the biennial communications referred to in Article 9, paragraph 5, of the Paris Agreement, including the information specified in the annex to decision 12/CMA.1. It encouraged other Parties providing resources to communicate such information biennially on a voluntary basis. CMA 1 also requested the secretariat to prepare, starting in 2021, compilations and syntheses of the information included in the biennial communications which will inform the global stocktakes.[60] This section provides an overview of the main issues as outlined in the compilation and synthesis of the first biennial communications.

142. In their first communications, developed country Parties acknowledged that financial support must be scaled up to meet the Paris Agreement goals. They reiterated their commitment to the goal of mobilizing jointly USD 100 billion per year by 2020 in the context of meaningful mitigation actions and transparency on implementation and referred to progress in that regard.

143. Projected levels of public climate finance to be provided to developing countries beyond 2020 were presented, based on the multi-year finance commitments and plans to allocate and disburse financial resources through bilateral and multilateral channels. Many Parties highlighted the increasing trend in their annual climate finance flows over the past years and their commitment to scale up, or at least maintain at a specific annual level, their provision of climate finance in the future.

144. Future levels of climate finance were projected on the basis of several assumptions, including that committed multi-year public climate finance will be approved annually for disbursement by national parliament, and that disbursement may be affected by socioeconomic challenges faced by developing countries and/or changing needs and priorities of recipient countries, for example as a result of the COVID-19 pandemic.

145. Information related to experience, challenges and lessons learned for informing future efforts in mobilizing and delivering climate finance includes coordination of stakeholders, both providers and recipients, to avoid overlaps and gaps in mobilization and delivery; enabling environments for strengthening the absorptive capacity of developing countries; and tracking and measuring the effectiveness of climate finance to strengthen its impact.

146. Many Parties outlined the support provided to developing countries for integrating climate change considerations, including climate resilience, into their international development assistance.

147. Many Parties emphasized that the Paris Agreement goals cannot be met unless finance flows are consistent with a low-emission and climate-resilient development pathway, and

[58] Decision 1/CMA.3, paras. 73–74.

[59] See https://unfccc.int/event/WIMExcom-inputs-GST.

[60] Decision 12/CMA.1. The compilation and synthesis of the submissions provided in 2021 is contained in FCCC/PA/CMA/2021/3. Available at https://unfccc.int/documents/278119. The Biennial Communications received are available at: https://unfccc.int/Art.9.5-biennial-communications.

underscored the importance of finance ministries, central banks and financial regulators in this regard. Accordingly, many Parties were taking action at the national level and supporting international cooperation on integrating climate change considerations into the economies and financial systems of developing countries. Through COVID-19 recovery packages, countries should be assisted in "building back better" towards a low-emission and climate-resilient future.

148. Many of the communications include the actions and plans of Parties for mobilizing private climate finance and refer to the crucial role of public intervention in unlocking finance at the scale required for achieving the Paris Agreement goals and meeting the climate investment needs of developing countries.

149. Parties provided information on programmes and initiatives for supporting developing countries in formulating and implementing climate action, identifying climate technology innovation, unlocking private climate finance, and capacity-building as key areas for support. Parties specified the elements that they consider key to ensuring the effectiveness and sustainability of the capacity-building activities they support.

150. Information related to policies associated with climate finance support is generally focused on strengthening recipient country ownership of climate action and ensuring the effectiveness of climate finance. Priorities for support relate to the LDCs and SIDS, sectors and target groups, commonly women, youth, indigenous peoples, vulnerable local communities, and micro, small and medium-sized enterprises in developing countries.

151. Parties reported on their efforts and varying progress in striking a balance between their support for mitigation and for adaptation. Grant-based adaptation finance for the LDCs and SIDS was highlighted in many communications, while others presented plans to scale up private finance for adaptation. Many Parties underlined their commitment to provide adaptation finance through the UNFCCC climate funds (AF, GCF, LDCF and SCCF).

152. Information on efforts to ensure that the climate finance provided addresses the needs and priorities of developing countries effectively was included by many Parties in their communications. They emphasized that (a) their climate finance is driven by developing country Parties' demands, which can enhance its effectiveness, sustainability and scalability; (b) for maximum impact, support, particularly for adaptation, must align with the national development plans of the recipient countries; and (c) capacity-building is crucial for helping developing countries to enhance their adaptation plans and formulate investment-ready climate project proposals.

153. CMA 3 underscored the importance of the information contained in the first biennial communications and identified in the compilation and synthesis, including in relation to:

(a) Making finance flows consistent with a pathway towards low-emission and climate-resilient development in accordance with Article 2, paragraph 1(c), of the Paris Agreement;

(b) Developing actions and plans for mobilizing private climate finance;

(c) Effectively addressing the needs and priorities of developing countries, including striking a balance between support for mitigation and adaptation;

(d) Integrating climate change considerations, including climate resilience, into international development assistance;

(e) Improving enabling environments to strengthen the absorptive capacity of developing countries;

(f) Reflecting on lessons learned for informing future efforts in providing, mobilizing and delivering climate finance.[61]

154. CMA 3 recognized that developed country Parties submitted information related to Article 9, paragraphs 1 and 3, of the Paris Agreement for the first time in 2020 and that improvements based on lessons learned should be considered when preparing biennial communications in 2022, taking into account the areas for improvement identified in the

[61] Decision 14/CMA.3, para. 7.

summary report and in accordance with the annex to decision 12/CMA.1, particularly in relation to:

(a) The indicative projections of climate finance for developing countries and specific plans for scaling up the provision and mobilization of climate finance;

(b) The information on the shares of projected climate finance for adaptation and mitigation, and on plans for addressing the balance between the two;

(c) Enhancing the quality and granularity of information on programmes, including projected levels, channels and instruments, particularly on climate finance for the LDCs and SIDS, and on relevant methodologies and assumptions.[62]

B. Technology development and transfer

155. Pursuant to Article 10 of the Paris Agreement and in response to a request from the CMA by decision 19/CMA.1, paragraph 23 (d), this section provides compiled and synthesized information on progress made in strengthening cooperative action on technology development and transfer by Parties, support provided to developing country Parties for the implementation of Article 10 of the Paris Agreement, technology needs as reported by developing country Parties in the context of achieving the long-term vision referred to in Article 10., paragraph 1, of the Paris Agreement and gaps and challenges on cooperative action on technology development and transfer and support provided.

1. Progress made in strengthening cooperative action on technology development and transfer for mitigation and adaptation and support provided

156. The compilation and synthesis of BRs presents aggregate level information on the provision of support for technology development and transfer by developed country Parties to developing country Parties. All developed country Parties that submitted a BR4 provided information on steps taken to promote, facilitate and finance the transfer of, or access to, climate technologies and know-how for developing countries. Those developed country Parties also completed CTF table 8, describing a selection of technology transfer activities that they have supported in developing country Parties.

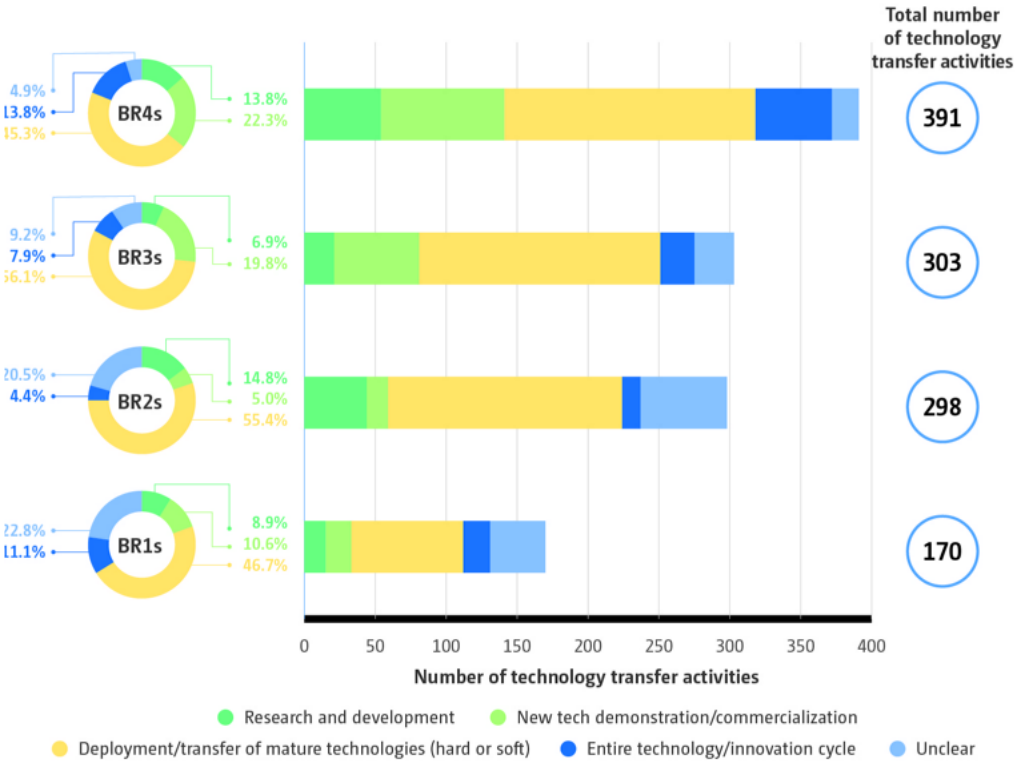
(a) Scale and channels of support

157. The synthesis of BR4s revealed that the provision of support for technology development and transfer has increased significantly. Developed country Parties have more than doubled their support for technology transfer activities since 2012–2013. In the BR4s, 22 developed country Parties reported a total of 391 activities (as reported in CTF table 8) relating to technology transfer (compared with 303 activities reported in the BR3s and 170 in the BR1s – see figure 17 below). More than 70 per cent of these activities had been implemented at the time of reporting, while the remainder were either at the planning stage or ongoing activities.

[62] Decision 14/CMA.3, paras. 13–14.

Figure 17

Support for technology transfer activities by stage of technology cycle reported by developed country Parties in their biennial reports



158. The support for technology development and transfer provided by developed country Parties encompasses support for both hardware (equipment) and software (know-how, methods, practices). Developed country Parties provided equal amounts of support for hard and soft technologies, which differs from the situation as reported in their BR3s (soft technology activities were supported 20 per cent more often than as reported in the BR4s). About 15 per cent of activities addressed both hard and soft technologies.

159. Several developed country Parties highlighted that they had mainstreamed technology transfer activities in their development cooperation activities with a view to contributing to sustainable development and achievement of the SDGs. In this context, Parties provided examples of supported technology transfer activities that, as well as contributing to achieving climate action (SDG 13), also contributed to achieving other SDGs, such as no poverty (SDG 1), zero hunger (SDG 2), good health and well-being (SDG 3), clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), decent work and economic growth (SDG 8) and industry, innovation and infrastructure (SDG 9).

160. Developed country Parties engaged in supporting technology transfer activities at the multilateral, regional and bilateral level. The focus on bilateral activities has increased (61 per cent of all technology activities in the BR4s, compared with 54 per cent in the BR3s). Regional and multilateral activities made up about 18 and 21 per cent, respectively, of all technology activities (compared with 23 per cent each in the BR3s). Bilateral cooperation continues to be the predominant channel of international support for technology transfer activities.

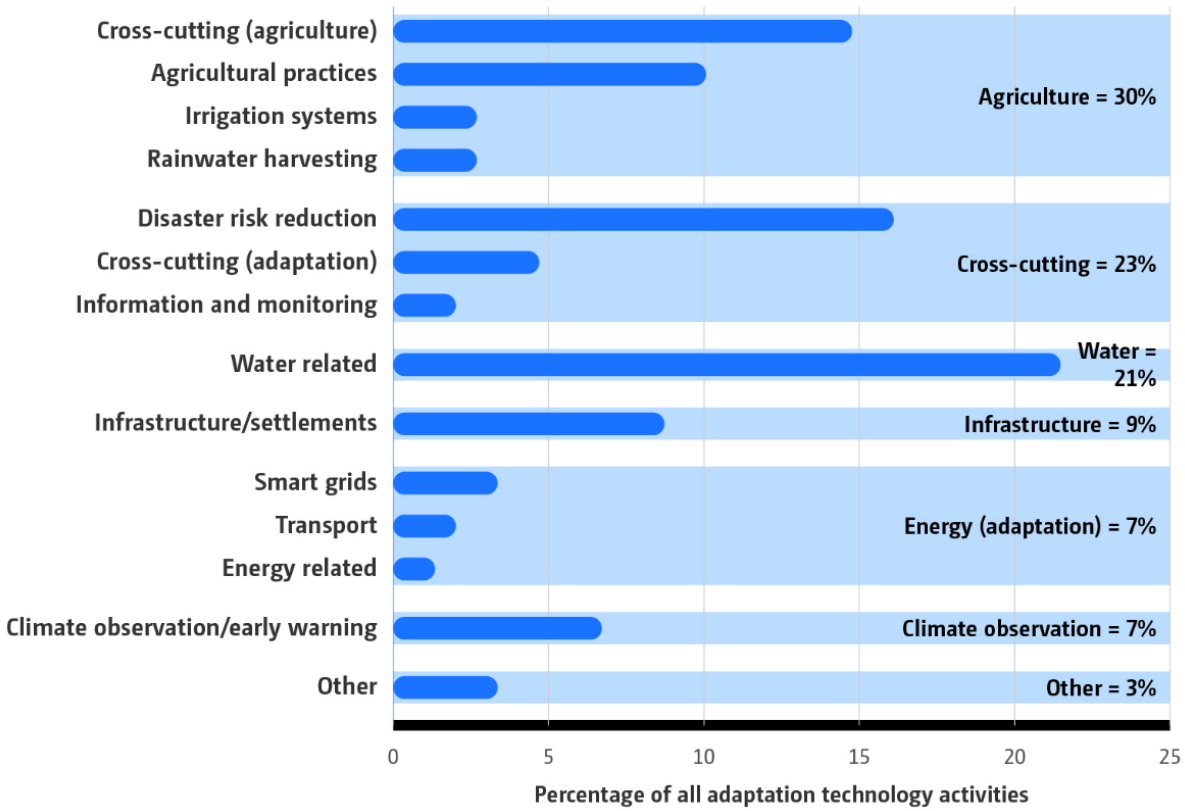
161. While sources of funding for supporting implementation of technology transfer activities were in most cases public (a finding consistent with that in previous BRs), the majority of activities reported in the BR3s were undertaken by public institutions (57 per cent), whereas Parties in their BR4s reported that the majority of activities were undertaken by public–private partnerships (63 per cent), representing a significant change in terms of the increasing role of public–private partnerships in undertaking technology transfer activities.

(b) Targeted areas, sectors and technologies

162. More than half (56 per cent) of supported activities were mitigation technology activities. Support for adaptation technology activities accounted for nearly a quarter of all supported activities (26 per cent). The remaining activities related to technologies that cut across both mitigation and adaptation. This distribution of mitigation, adaptation and cross-cutting activities is similar to that reported in the BR3s.

163. Support for adaptation technology activities mainly targeted the agriculture, cross-cutting and water sectors (see figure 18 below). This differs slightly from the support for adaptation technology activities reported in the BR3s, which was dominated by the cross-cutting sector. Many of the supported adaptation technology activities in the agriculture sector were related to agricultural practices, such as seed or crop improvements, climate-smart or biological farming, or general food security improvements, which were also frequently reported in the BR3s. Support for technologies that cut across adaptation sectors (cross-cutting technologies) were frequently related to general infrastructural development, or research and development activities. As they were also in the BR3s, disaster risk reduction activities were often reported by Parties, whereas the share of information-sharing activities has declined since the BR3s. Regarding the water sector, technologies such as water supply systems, water desalination and water harvesting were often reported in the BR4s.

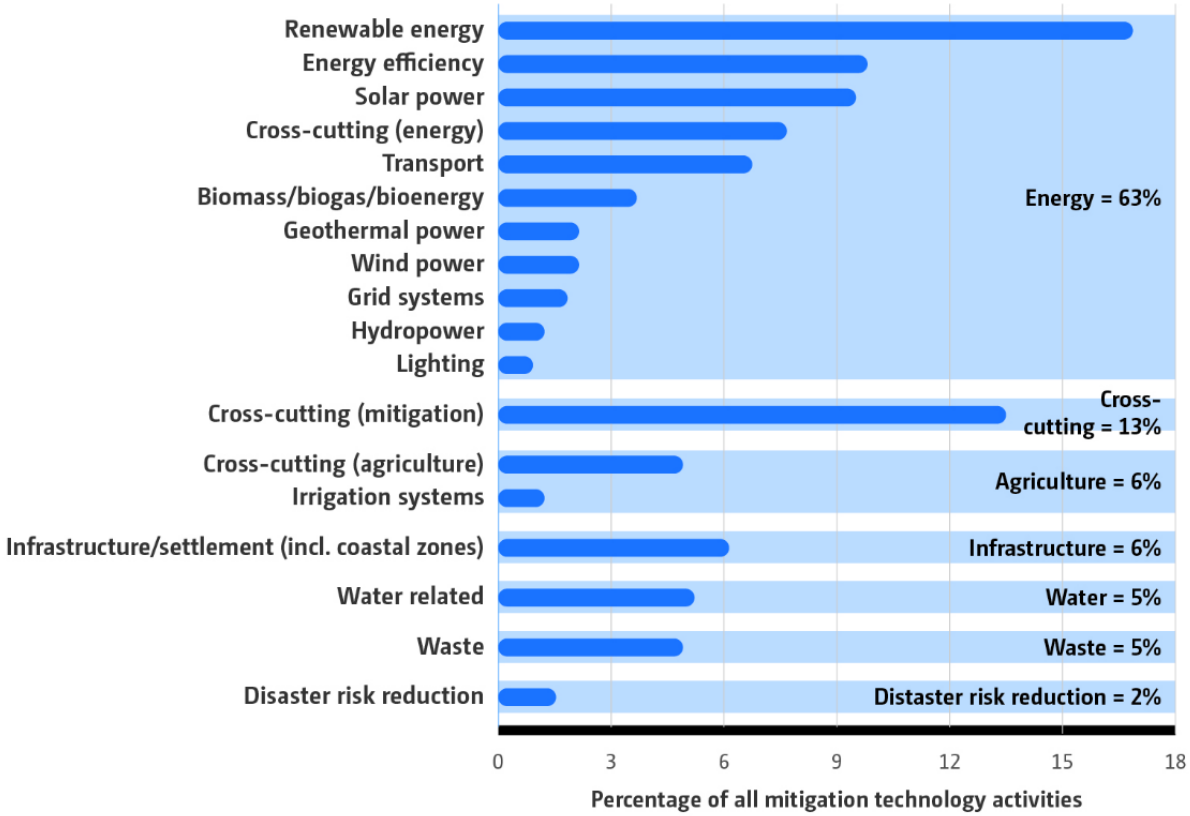
Figure 18
Adaptation technology activities reported by developed country Parties in their fourth biennial reports



164. Support for mitigation technology efforts continued to focus on the energy sector (about 63 per cent) (see figure 19 below). Other sectors such as agriculture, infrastructure, water and waste each represented a small share of support for mitigation technology efforts. The majority of support for mitigation efforts in the energy sector was related to renewable energy and energy efficiency. Support for renewable energy covered implementation of either general renewable energy technology efforts or specific renewable energy technologies, such as solar, biomass, geothermal, wind and hydropower. The focus on renewable energy technologies is comparable with the focus of the mitigation technology activities reported in the BR3s. Support for cross-cutting activities mainly focused on

demonstration projects of specific technologies, including pilot projects and training, as well as research and development activities.

Figure 19
Mitigation technology activities reported by developed country Parties in their fourth biennial reports



165. Some Parties highlighted that the support provided for technology transfer activities responded to the technology needs of developing countries. Parties underlined that activities were undertaken according to the specific needs and circumstances of recipient countries, acknowledging the different technology and capacity-building needs. Such activities ranged from support for renewable energy and energy efficiency equipment to training for operating and maintaining early warning systems. In this context, the technology transfer activities reported by Parties in their BR4s are very much in line with the findings of the fourth synthesis report on prioritized technology needs identified by 53 non-Annex I Parties in their TNAs (see subsection 2 (b) below).[63]

(c) Support provided to developing country Parties for strengthening cooperative action on technology development and transfer at different stages of the technology cycle

166. Developed country Parties provided support to developing country Parties for the implementation of Article 10 of the Paris Agreement, including for strengthening cooperative action on technology development and transfer at different stages of the technology cycle in line with Article 10, paragraph 6, of the Paris Agreement. The supported activities can be distinguished by the three stages of the technology cycle: research and development, new technology demonstration, deployment of mature technologies and the entire technology cycle (from research to deployment).

167. The technology transfer activities reported in the BR4s are predominantly related to the later stages of the technology cycle, namely the actual deployment of mature technologies (see figure 17 above). However, support for the early stages of the technology cycle has increased since previous BRs. As reported in the BR4s, technology activities in the early stages of the technology cycle represented more than one third of all supported activities

[63] See document FCCC/SBI/2020/INF.1.

compared with about a quarter according to the BR3s. Some Parties highlighted that the technology support they provided also aimed at contributing to the implementation of the Paris Agreement, including support for collaborative approaches to research and development and facilitating access to technology, in particular for the early stages of the technology cycle, in line with Article 10, paragraph 5, of the Paris Agreement.

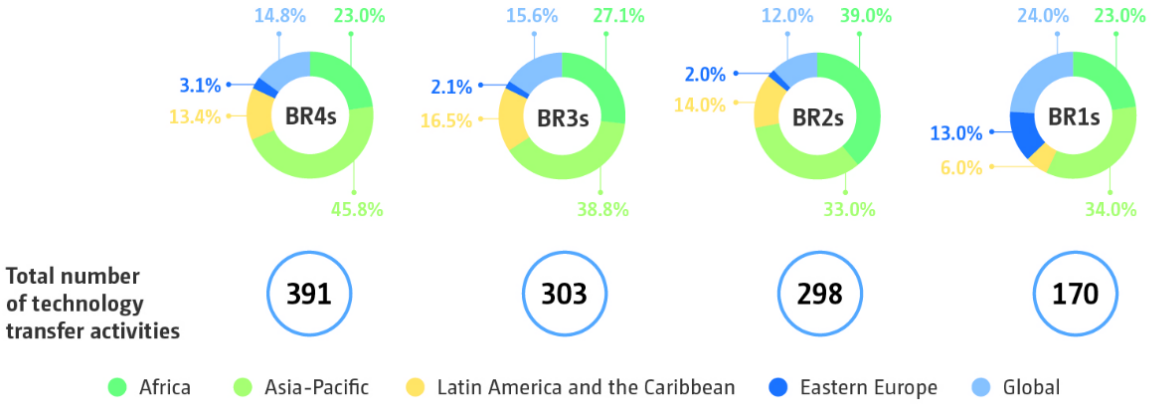
(d) Endogenous capacities and technologies

168. The Paris Agreement highlights the importance of developing and enhancing endogenous capacities and technologies to support developing countries in implementing the Paris Agreement. Several Parties provided support for building endogenous capacities and technologies in recipient countries so as to ensure sustainable uptake of climate technologies by target groups. In doing so, they highlighted that building endogenous capacities and technologies helps ensure that technology transfer is implemented in country-specific ways, building on existing knowledge and practices and using local governance structures. Activities included collaborating with country partners at the proposal and design stage of activities and involving local people in installing and operating projects, followed up by tailored training programmes to ensure proper control, function and routine maintenance of the implemented climate technologies.

(e) Geographical distribution

169. The Asia-Pacific region continued to benefit most from the reported technology support (see figure 20 below), with almost half (46 per cent) of all technology support focusing on the region. The level of support for technology for the African region (23 per cent) and Latin America and Caribbean region (13 per cent) has also not changed significantly since the BR3s. Parties targeted more than half (62 per cent) of technology activities reported in the BR4s at the LDCs and SIDS, which is a slight decrease compared with the proportion reported in the BR3s (68 per cent).

Figure 20
Distribution by region of technology transfer activities reported by developed country Parties in their biennial reports



2. Technology needs to achieve the long-term vision on fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions

170. In accordance with Article 10, paragraph 1 of the Paris Agreement, Parties share a long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce GHG emissions. This section contains compiled and synthesized information on technology development and transfer for NDC implementation provided by Parties and technology needs of developing country Parties to mitigate or adapt to climate change in the context of achieving this long-term vision.

(a) Technology development and transfer for nationally determined contribution implementation

171. The synthesis report on NDCs synthesizes information from the latest available NDCs communicated by Parties to the Paris Agreement. With regard to information on technology development and transfer for NDC implementation, the NDCs of most Parties covered qualitative aspects and many also covered quantitative aspects.

172. Many Parties referred to technology development and transfer in the context of actions that inherently address both adaptation and mitigation or focus solely on mitigation. Many Parties also referred to climate technology for adaptation.

173. Information provided by Parties on climate technology related matters mainly covered specific technologies to be deployed; technology needs; policy, regulatory and legal aspects; technology innovation, research and development; and support required by Parties or support provided by Parties for technology development and transfer.

174. In terms of specific technologies that Parties intend to use for achieving their adaptation and mitigation targets, those most frequently identified were cross-sectoral energy-efficient appliances and processes; enhanced use of renewable energy technologies such as hydropower, solar, wind and biomass; low- or zero-emission vehicles; blended fuel; waste to energy technologies; and climate-smart agriculture.

175. Technology needs mentioned by Parties were mainly in the areas of energy, agriculture, water, waste, transport, climate observation and early warning. Regarding technology innovation, research and development, some Parties included information on promoting collaboration between countries and promoting institutions, mechanisms, tools and business models that foster progress in this area. Actions on policy, regulatory and legal aspects commonly referred to by Parties included developing or updating policies and strategies to promote technology innovation, promoting use of renewable energy and accelerating adoption and transfer of climate technologies. A few Parties included specific information on their intended provision of support to developing country Parties, while some Parties indicated the support needed for development and deployment of clean technologies, for example in the areas of energy, energy efficiency and agriculture. Some Parties referred to TNAs and TAPs in identifying priority technology needs in adaptation and mitigation.

(b) Technology needs of developing country Parties

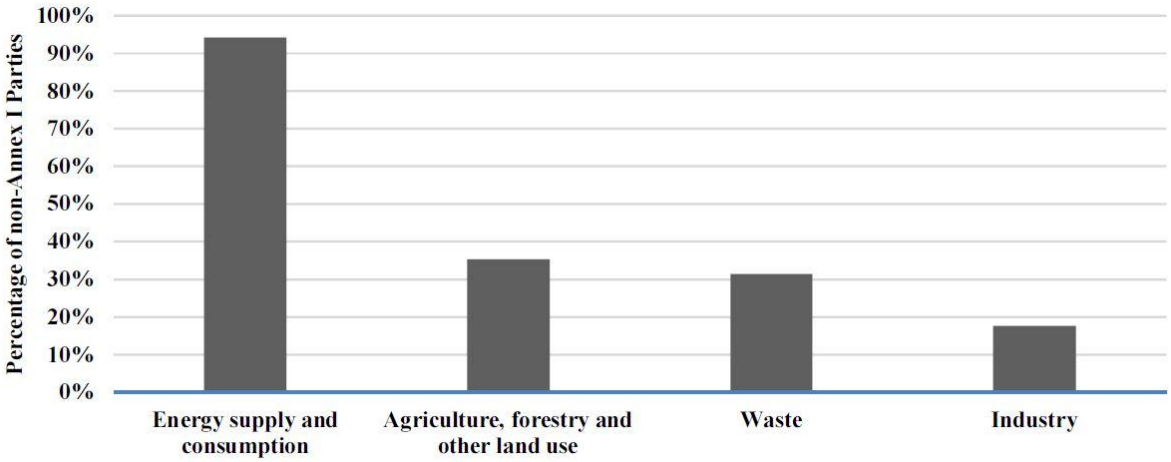
176. The fourth synthesis of technology needs identified by Parties not included in Annex I to the Convention synthesizes information contained in the TNA reports, barrier analysis and enabling framework reports, and TAP reports of 53 Parties not included in Annex I to the Convention that participated in phases I (2009–2013) and II (2014–2017) of the global TNA project. It provides an overview of the technology needs of those Parties aiming to mitigate GHG emissions and facilitate adaptation to the adverse impacts of climate change.

(i) Targeted sectors and technologies for mitigation

177. For mitigation, energy was the most commonly prioritized sector (by 94 per cent of the Parties). Within the energy sector, the most commonly prioritized subsectors were energy industries (88 per cent of the Parties) and transport (53 per cent).

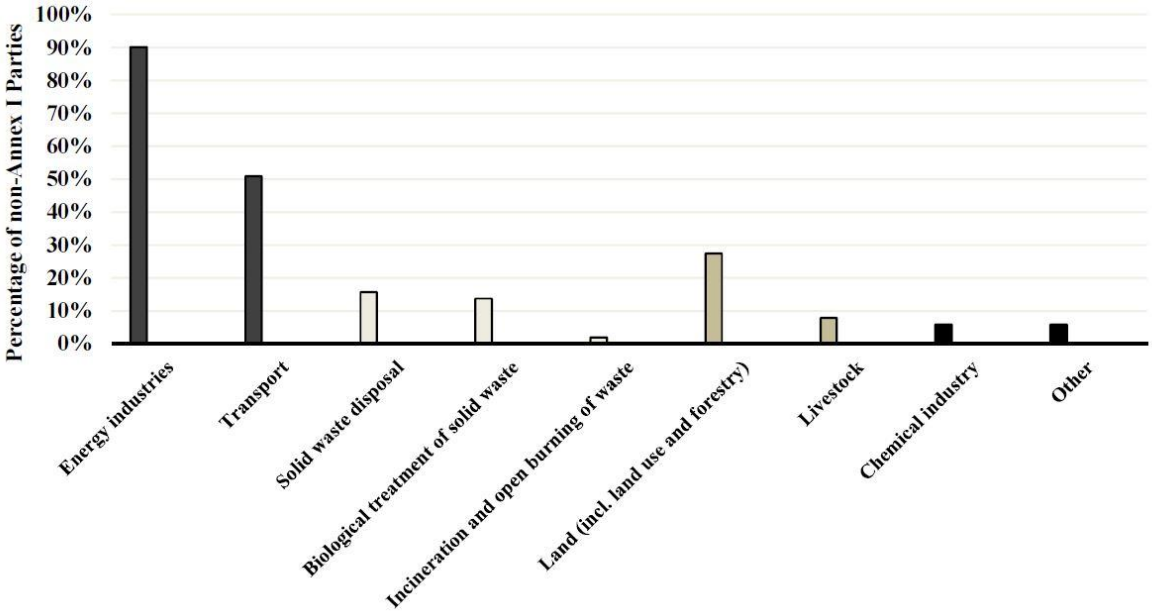
178. The agriculture, forestry and other land use sector was prioritized by 35 per cent of the Parties. Of those, 27 per cent prioritized the land subsector (including land use, land-use change and forestry). Other mitigation sectors prioritized by the Parties are shown in figure 21 below.

Figure 21
Prioritized sectors for mitigation reported in technology needs assessments of Parties



179. Figure 22 below presents the most commonly prioritized subsectors for mitigation for all Parties. The energy industries subsector was prioritized by almost all Parties, followed by the transport subsector, which was prioritized by 50 per cent of the Parties.

Figure 22
Prioritized subsectors for mitigation reported in technology needs assessments of Parties



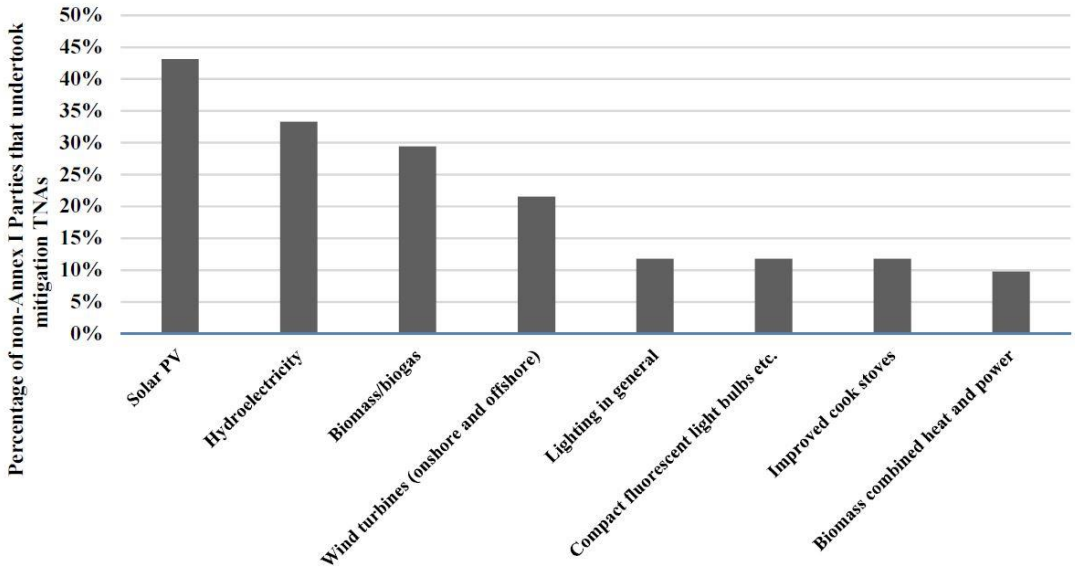
180. Notably, the sectors or subsectors prioritized by Parties for mitigation are generally the sectors with the highest GHG emission levels nationally. A similar relationship can be observed between the development priorities of Parties and the sectors prioritized by them for mitigation.

181. For mitigation, Parties identified more than 950 technology options in their preliminary lists (or "long lists") of technologies within their prioritized mitigation sectors or subsectors. More than 350 technology options were prioritized by Parties.

182. Within the energy sector (the most frequently prioritized mitigation sector), the majority of the technologies prioritized for the energy industry subsector were related to electricity generation and were renewable energy technologies. Solar photovoltaic and hydroelectricity generation technologies were the most frequently prioritized (by 43 and 33 per cent of the Parties that undertook mitigation TNAs, respectively) (see figure 23 below).

Figure 23

Prioritized technologies for the energy industries subsector reported in the technology needs assessments of Parties



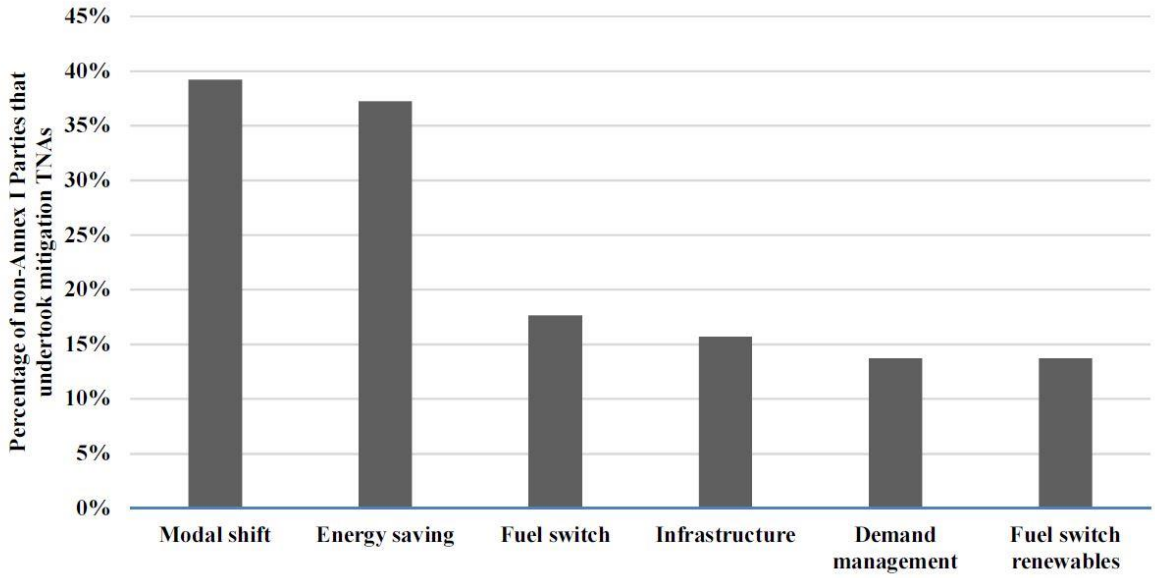
183. In terms of scale of application, a minority of the prioritized technologies for electricity generation were small-scale technologies (i.e. for home application or not generally connected to the grid). Most of the technologies within that category were for medium- or large-scale application (i.e. grid-connected plants).

184. Most of the prioritized technologies for electricity generation could be applied in the short term. Some were better suited to the medium or long term, as they were either at the research, development or demonstration stage of development, or in the process of market deployment.

185. For the transport subsector of the energy sector, 39 per cent of the Parties prioritized technologies related to modal shift, such as mass rapid transit road or rail systems, and 37 per cent prioritized energy-saving technologies, including vehicle technology improvements. Figure 24 below illustrates the most commonly prioritized technologies for the transport subsector.

186. In the transport sector, Parties mostly prioritized soft technologies, aimed at instituting behavioural change in relation to transportation and improvement of infrastructure, which could be applied in the short to medium term.

Figure 24
Prioritized technology categories in the transport subsector reported in the technology needs assessments of Parties



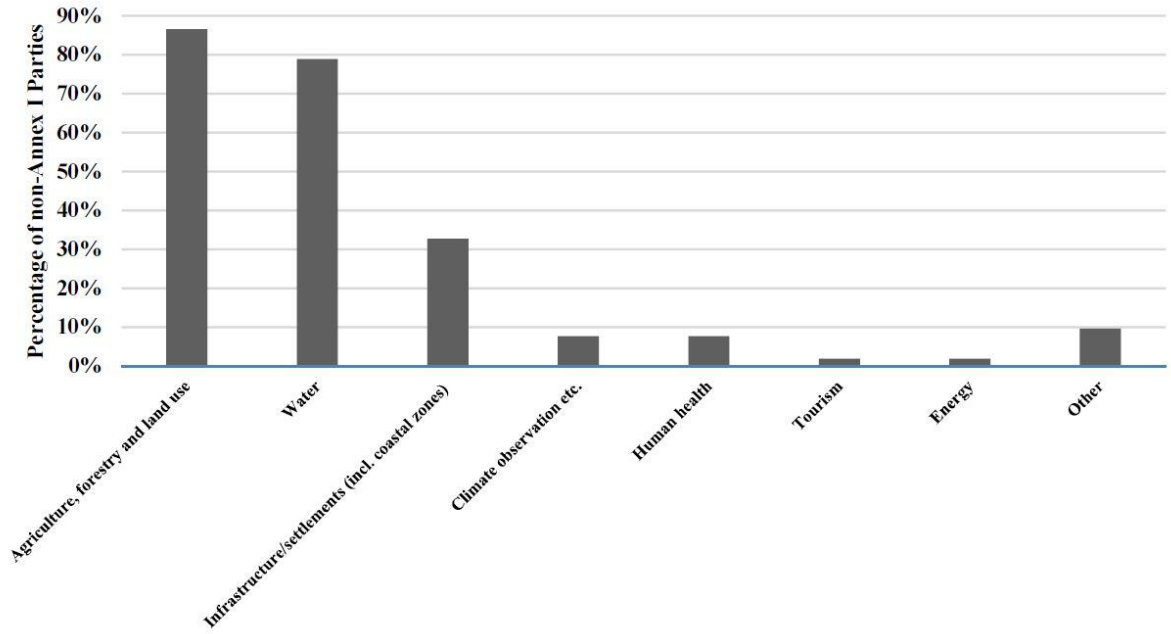
187. For the agriculture, forestry and other land use sector, prioritized technologies for mitigation in the forestry subsector covered a wide range of categories. These included forest conservation technologies, such as the protection of forest areas, promotion of sustainable forest management and general improvement of forest management. Sink enhancement (afforestation or reforestation) and forest rehabilitation and restoration techniques were also among the prioritized technologies.

188. Technologies prioritized for the agriculture subsector of the agriculture, forestry and other land use sector included mainly new or alternative agricultural practices, such as organic farming; classic, mini or no tillage; fertilizer dosing; and irrigation techniques.

(ii) Targeted sectors and technologies for mitigation and adaptation

189. For adaptation, the most commonly prioritized sectors were agriculture (87 per cent of the Parties), water resources (79 per cent) and infrastructure and settlements, including coastal zones (33 per cent). Figure 25 below illustrates the sectors that were prioritized by Parties for adaptation.

Figure 25
Prioritized sectors for adaptation reported in the technology needs assessments of Parties



190. For adaptation, Parties identified more than 1,000 technology options in their preliminary lists (or "long lists") of technologies within their prioritized adaptation sectors. More than 400 technology options were prioritized.

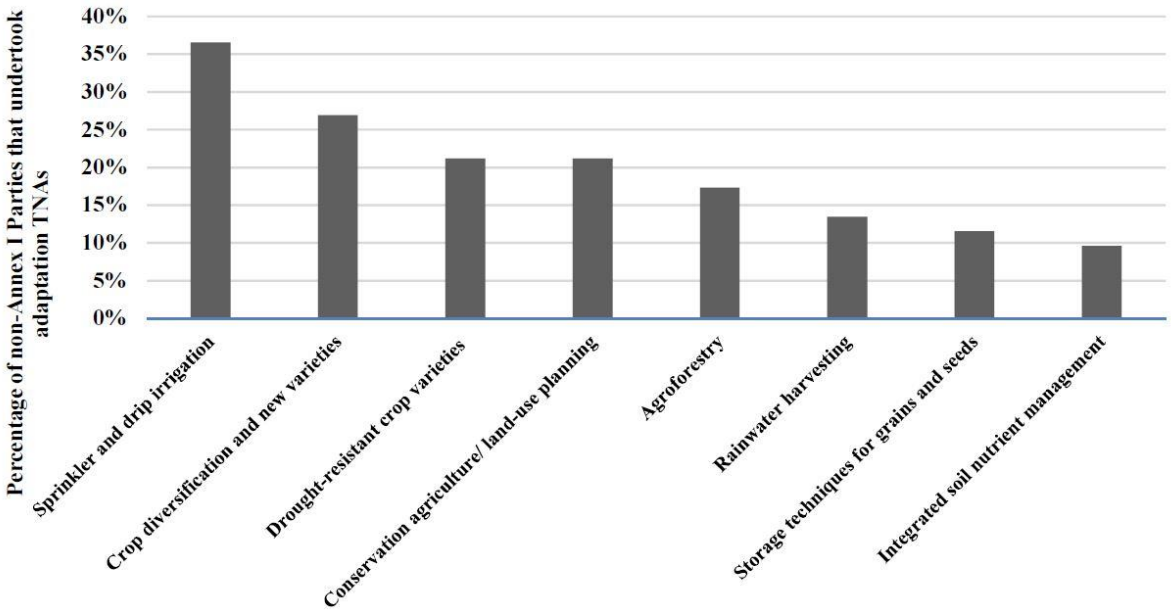
191. The technology needs identified in relation to adaptation comprised both hard technologies, such as dykes and floodwalls, sprinkler and drip irrigation systems, and drought-resistant crop varieties, and soft technologies, such as the establishment of water user associations and the roll-out of knowledge transfer and awareness campaigns.

192. Some Parties also prioritized indigenous technologies that could be used to assist national adaptation to changing weather conditions, such as traditional housing designs, bunds, levees, dykes and mangrove plantations. In that regard, the needs identified were generally related to the deployment and diffusion of the technologies and the further improvement of their design and quality through research and development.

193. Within the agriculture sector (the most commonly prioritized adaptation sector), most of the technologies prioritized were related to sprinkler and drip irrigation (prioritized by 37 per cent of Parties), as well as biotechnologies, including technologies related to crop improvement, new varieties and drought-resistant, salient-tolerant and short-maturing varieties (together prioritized by more than 50 per cent of Parties). Conservation agriculture and land-use planning was prioritized by 21 per cent of Parties undertaking TNAs for adaptation. Figure 26 below shows the most commonly prioritized technologies for the agriculture sector.

Figure 26

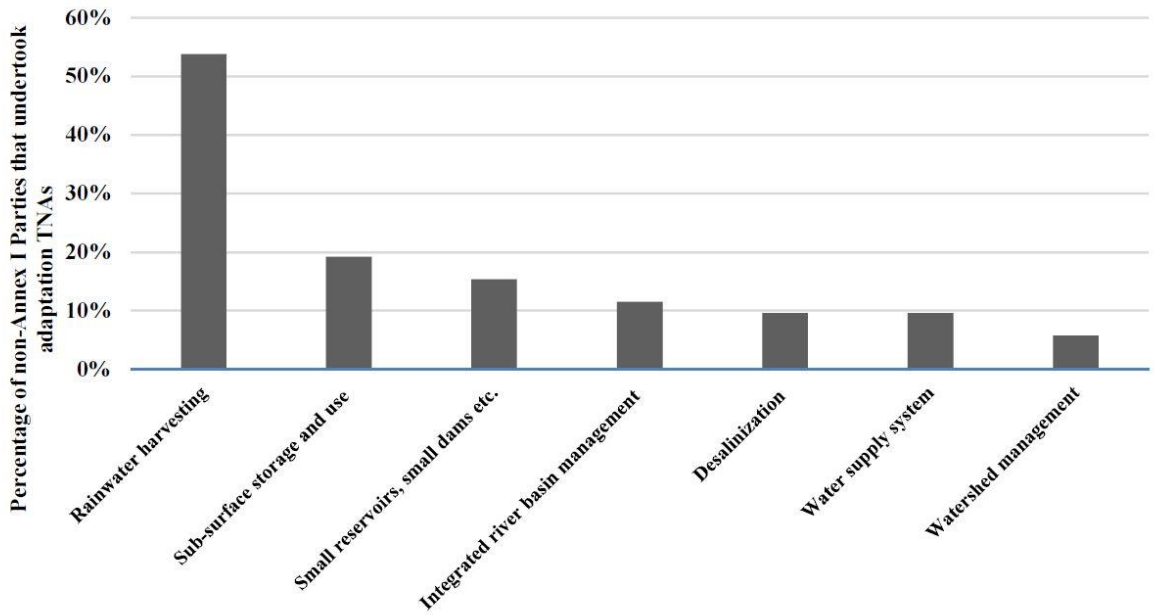
Prioritized technologies in the agriculture sector reported in technology needs assessments of Parties



194. In the water sector, Parties prioritized technologies relating to rainwater harvesting (54 per cent of the Parties) and water storage and catchment (35 per cent). Figure 27 below presents the most commonly prioritized technologies in the water sector.

Figure 27

Prioritized technologies in the water sector reported in technology needs assessments of Parties



195. Within the infrastructure and settlements sector (including coastal zones), most of the prioritized technologies were related to coastal protection, including both hard and soft measures. The most commonly prioritized technologies related to wetland restoration and natural disaster prevention, such as early warning systems. Others included sea walls, mapping and surveying, and beach reclamation.

(iii) Budgets estimated in technology action plans

196. Approximately 77 per cent of Parties provided estimates of the budget required for the actions specified in their TAPs, including 60 per cent of Parties in phase I and all Parties in phase II. The difference in the prevalence of reporting on budget requirements is most likely due to new TAP guidance. Most Parties specified a budget for each action within their TAPs. Parties also calculated a budget for the activities under each action; however, a few Parties calculated a budget for the overall TAP only. Additionally, while some of the Parties specified annual costs, most indicated costs for the entire time frame of their TAPs.[64]

197. For mitigation, the total cumulative budget requested by Parties for their TAPs was USD 20.1 billion: USD 5.2 billion requested by phase I Parties and USD 14.9 billion by phase II Parties. Three Parties reported budgets over USD 1.5 billion, while several other Parties reported total budgets that did not exceed USD 10 million.

198. For adaptation, the total cumulative budget requested by Parties for their TAPs was USD 4.4 billion: USD 2.4 billion requested by phase I Parties and USD 2.0 billion by phase II Parties. Four Parties reported budgets over USD 350 million, while several other Parties reported total budgets that did not exceed USD 10 million.

199. Tables 4–5 below provide an overview of the estimated total budget required for TAP actions by action category and time frame.

Table 4
Budgets for the actions contained in technology action plans of Parties in their technology needs assessments for mitigation
(USD billion)

Category	*<5 years*	*5–10 years*	*>10 years*	*Total*
Infrastructure	3.87	2.01	4.07	9.95
Multiple categories[a]	1.41	4.66	1.01	7.08
Economic and financial	1.29	0.23	0.05	1.57
Research and development	0.80	0.02	0.01	0.82
Institutional and organizational capacity	0.10	0.15	0.02	0.26
Policy, legal and regulatory	0.06	0.13	0.01	0.20
Information and awareness-raising	0.08	0.01	0.06	0.15
Other	0.04	0.01	0	0.05
Total	**7.65**	**7.22**	**5.21**	**20.09**

[a] Refers to actions contained in TAPs that cover a combination of several categories of action. For example, an action in this category may consist of economic and financial measures integrated into information and awareness-raising campaigns alongside policy, legal and regulatory measures.

Table 5
Budgets for the actions contained in the technology action plans of Parties in their technology needs assessments for adaptation
(USD billion)

Category	*<5 years*	*5–10 years*	*>10 years*	*Total*
Multiple categories[a]	1.06	0.20	0.00	1.26
Economic and financial	0.19	0.37	0.62	1.17
Infrastructure	0.63	0.03	0.30	0.95

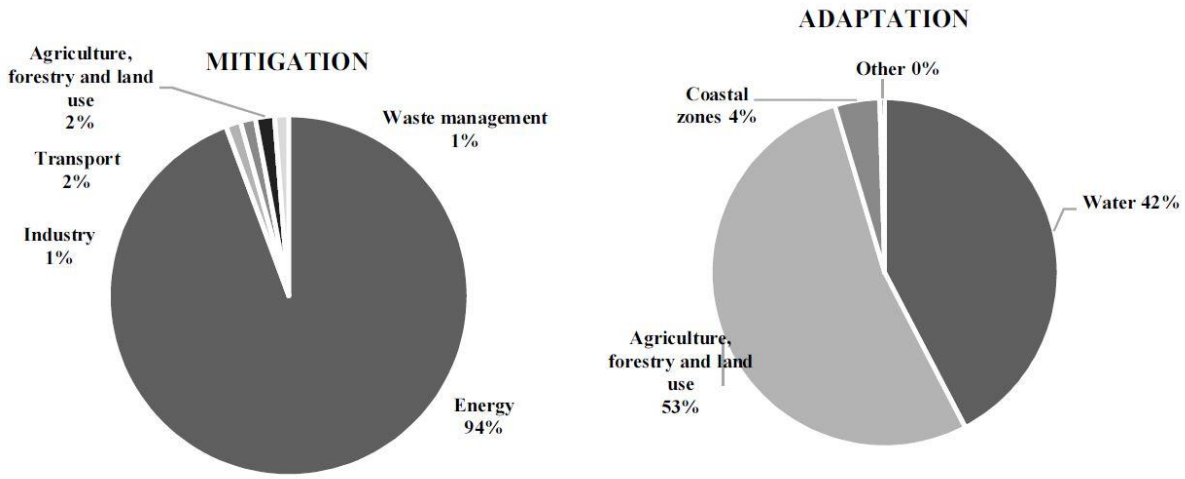
[64] The budget reported by Parties in their TAPs is usually the estimated overall budget requested for TAP implementation. The figures may therefore not necessarily reflect the overall incremental costs of a project over its lifetime, as they may not include project revenues.

Category	*<5 years*	*5–10 years*	*>10 years*	*Total*
Institutional and organizational capacity	0.30	0.11	0.02	0.44
Policy, legal and regulatory	0.14	0.13	0.01	0.28
Information and awareness-raising	0.20	0.01	0.04	0.21
Research and development	0.07	0.04	0.00	0.11
Other	0.01	0.01	0.01	0.03
Total	**2.60**	**0.88**	**0.96**	**4 45**

[a] Refers to actions contained in TAPs that cover a combination of several action categories. For example, an action in this category may consist of economic and financial measures integrated into information and awareness-raising campaigns alongside policy, legal and regulatory measures.

200. The highest total cumulative TAP mitigation budgets were estimated for the energy subsector of energy industries (USD 18.8 billion, 92 per cent of the total) and transport (USD 389 million, 2 per cent of the total). For adaptation, the highest total cumulative budget was estimated for the agriculture and water sectors at USD 2.34 billion (53 per cent) and USD 1.81 billion (42 per cent), respectively (see figure 28 below).

Figure 28
Budget by sector for technology action plans for mitigation and adaptation identified by Parties as part of their technology needs assessments



201. The budget requirements for TAPs were country specific. Several Parties requested large infrastructure investments to accelerate the development and deployment of large-scale electricity generation technologies. Other Parties requested significant government budgets for the provision of financial incentives, such as subsidies, tax schemes and financial grants.

3. Gaps and challenges for cooperative action on technology development and transfer and support provided

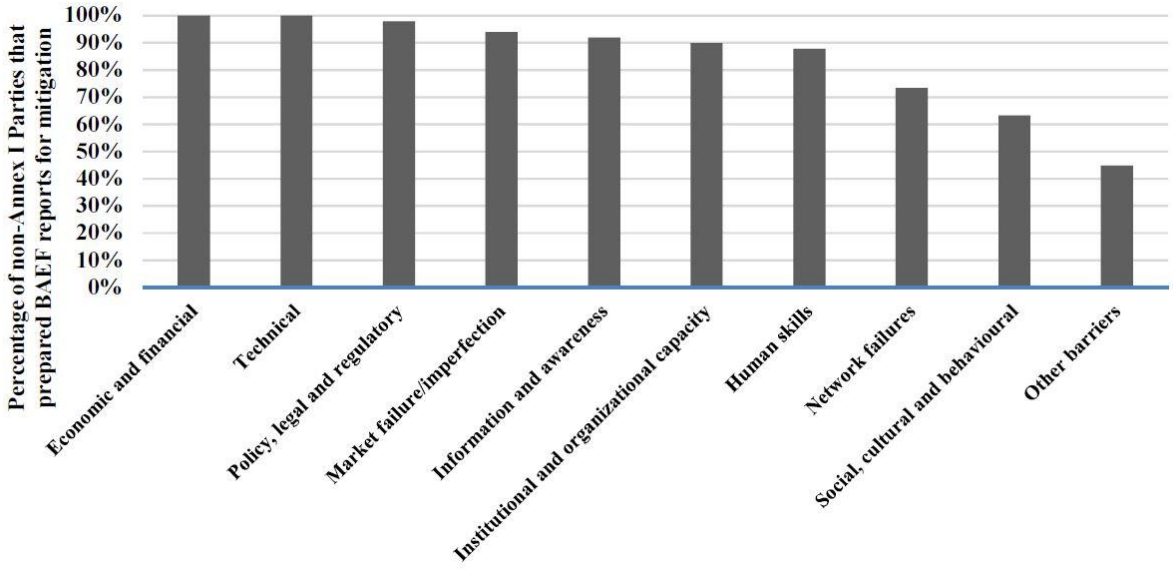
202. After prioritizing technologies as part of the TNA process, most of the developing country Parties identified and analysed technology-specific barriers to the development and transfer of their prioritized technologies and identified possible measures to overcome such barriers.

(i) Barriers to and enablers of mitigation technologies

203. Overall, irrespective of the sector, all Parties identified economic and financial and technical barriers to the development and transfer of prioritized technologies for mitigation (see figure 29 below).

204. Within the economic and financial category, most of the Parties (92 per cent) identified lack of or inadequate access to financial resources as the main barrier, irrespective of the sector or technology. In the technical category, many of the Parties identified system constraints and insufficient expertise as the main barriers (71 and 70 per cent, respectively).

Figure 29
Overview of barriers to technologies for mitigation identified in barrier analyses of Parties



205. For mitigation, the most commonly mentioned cross-sectoral enabler was the provision or expansion of financial incentives for the implementation and use of the prioritized technology. Another commonly cited measure was the formulation or updating of regulations, policies and standards related to the technology. Other measures mentioned as being cross-sectoral were capacity-building and the establishment of stakeholder networks and information and awareness programmes to promote and develop capacity with regard to the specific technology.

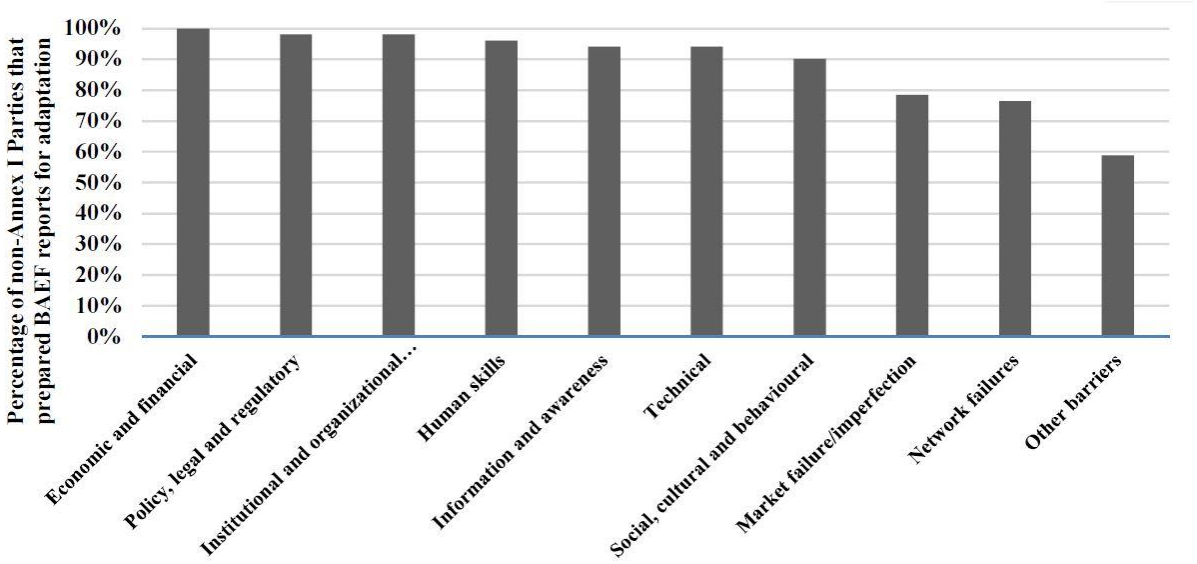
(ii) Barriers to and enablers of adaptation technologies

206. For adaptation, irrespective of the sector or technology, all Parties identified economic and financial barriers. Policy, legal and regulatory (98 per cent of the Parties), institutional and organizational capacity (98 per cent) and human skills (96 per cent) were also commonly mentioned categories of barriers to the development and transfer of prioritized technologies (see figure 30 below).

207. Within the economic and financial category, most of the Parties (92 per cent) identified lack of or inadequate access to financial resources as the main barrier. For the policy, legal and regulatory category, the most common barrier was an insufficient legal and

regulatory framework (92 per cent). With regard to institutional and organizational capacity, the most frequently reported barrier was limited institutional capacity (88 per cent), while for the human skills category, the most commonly reported barrier was lack of skilled personnel for the installation and operation of climate technologies (90 per cent).

Figure 30
Overview of barriers to technologies for adaptation identified in the barrier analyses of Parties



208. For adaptation, the most commonly mentioned cross-sectoral enabler of adaptation technologies was increasing the financial resources available for a specific technology by introducing or increasing allocations in national budgets or identifying and creating financial schemes, funds, mechanisms or policies. Another commonly mentioned measure was strengthening the current relevant institutions by increasing the number of staff and facilities in order to accelerate the research and development of the technology.

209. Other commonly mentioned cross-sectoral enablers for adaptation technologies were capacity-building and the establishment of information and awareness-raising programmes to promote and develop capacity with regard to the technology.

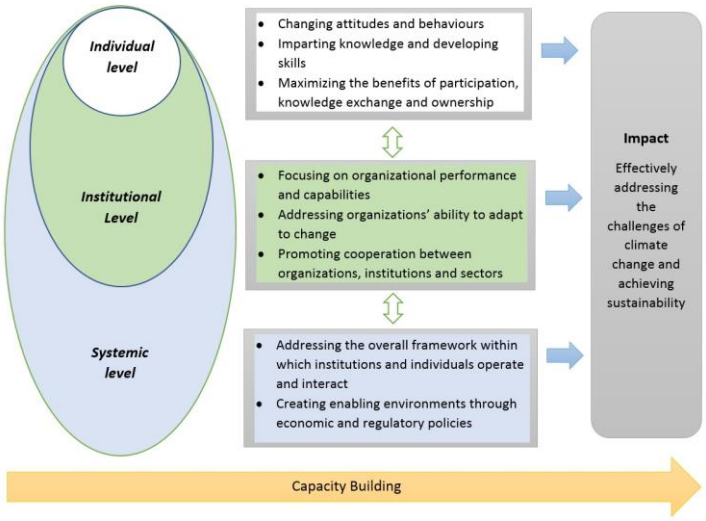
C. Capacity-building

210. In line with Article 11 of the Paris Agreement and in response to a request by the CMA contained in decision 19/CMA.1, paragraph 36 (d), this section provides compiled and synthesized information on progress made on enhancing the capacity of developing country Parties to implement the Paris Agreement, international cooperation and enhanced support from developed country Parties in this regard, and persisting capacity gaps and needs, as reported by developing country Parties. Progress made on enhancing the capacity of developing country Parties is presented in line with the elements highlighted in Article 11, paragraph 1 of the Paris Agreement, namely mitigation and adaptation; technology development, dissemination and deployment; access to finance; education, training and public awareness; and the transparent, timely and accurate communication of information.

211. For all aspects of this section, capacity-building at the systemic, institutional and individual levels has been considered, with systemic capacity focusing on the overall framework within which institutions and individuals operate and interact, including policies, rules and regulations; institutional capacity focusing on the capabilities and performance of institutions and their ability to adapt to change and to cooperate with one another; and

individual capacity focusing on knowledge and skills development, including for effective participation, knowledge exchange, and behavioural change as shown in figure 31 below.[65]

Figure 31
Capacity-building at the systemic, institutional and individual levels



Source: UNFCCC website on capacity-building in the UNFCCC process.[66]

212. Owing to the structure and format in which information on capacity-building activities and capacity gaps and needs has been reported by Parties, it was not possible to present distinct overviews for each of the three levels of capacity-building.

1. Progress made on enhancing the capacity of developing country Parties

213. While progress has been made on enhancing the capacity of developing country Parties at the systemic, institutional and individual levels, developing countries continue to face capacity gaps and needs for the implementation of the Paris Agreement. At the systemic level, developing country Parties have been making significant efforts to develop and implement national climate change laws, regulations, policies and strategies to ensure a more systematic integration of climate action at the national and sectoral levels. At the institutional level, capacities have been enhanced to address various aspects of climate change, including national and sector-specific mitigation and adaptation actions, for example in the areas of agriculture, energy, forestry and health. Capacities have also been enhanced to provide access to support for climate action, for example through the establishment of an NDA for the GCF or an NDE for the CTCN, and for meeting reporting requirements under the Convention. At the institutional and individual levels, developing country Parties also reported on measures to build capacity at national, subnational and local levels, including those of government entities and civil society organizations. Measures also included strengthening technical skills and knowledge through training and the exchange of experiences, mostly in the context of broader capacity-building programmes and activities for both climate change mitigation and adaptation.

(a) Mitigation and adaptation

214. Many developing country Parties reported on enhanced capacity for mitigation actions, including in the:

(a) Agriculture sector through training on use of low-emission technologies and practices;

[65] See also the UNFCCC website on capacity-building at: https://unfccc.int/topics/capacity-building/the-big-picture/capacity-in-the-unfccc-process.

[66] As footnote 66 above.

(b) Energy sector through training on energy efficiency and energy audits in buildings, and renewable energy technologies, including geothermal heat and solar thermal power;

(c) Forestry sector through projects on carbon dioxide removals, forest and biodiversity management, auditor training, monitoring, inventory and carbon accounting, forest reference levels, forest certification schemes, and establishing and reporting on REDD+ programmes;

(d) Industry sector through training of technicians in energy-efficient plant operations;

(e) Waste sector through training on integrated waste management and on energy generation from agricultural and urban waste.

215. Many developing country Parties also reported on enhanced capacity for adaptation actions, including through:

(a) Formulating adaptation targets, including in NDCs, and developing and implementing adaptation strategies and plans, including NAPs;

(b) Establishing new, and improving existing, institutional arrangements;

(c) Implementing community-based adaptation activities;

(d) Engaging academia and civil society in the development and delivery of capacity-building programmes;

(e) Providing training at the institutional and individual level for mainstreaming adaptation actions within and across institutions and sectors;

(f) Implementing sector-specific measures, including in the:

(i) Agriculture sector through risk management plans, rural resilience programmes, and training for agricultural enterprises, technicians, farmers and civil society;

(ii) Coastal zones through programmes on the protection of mangroves and sustainable management of coastal and marine areas and biodiversity;

(iii) Construction sector through training on preparedness for natural disasters and sea level rise;

(iv) Fisheries sector through the adoption of fishing site identification systems, types of insurance, income stabilization funds, sustainable aquacultures and rewards for environmental services;

(v) Forestry sector through programmes on the prevention of fires and training on value chains of non-timber forest products;

(vi) Health sector through health adaptation plans, training for health personnel for crisis and disaster management, monitoring and evaluation mechanisms, and early warning systems;

(vii) Urban areas through the development and implementation of policies and training for integrating adaptation into development planning;

(g) Water sector through training in the areas of water conservation and efficiency and participatory irrigation projects.

(b) Technology development, dissemination and deployment

216. Many Parties highlighted the ways in which capacities related to technology development, dissemination and deployment have improved, including through:

(a) Adoption of green technology policies that increased the capacity of innovative technology;

(b) Development and implementation of TNAs and TAPs;

(c) Research on renewable energy and adaptation technologies;

(d) Fostering of increased mobility of researchers between government, academia and the private sector;

(e) Training on energy audits and management;

(f) Establishment of innovation hubs for clean technology entrepreneurs and green economy experts.

(c) Access to finance

217. Some developing country Parties reported that they increased their capacity to access climate finance through the GCF Readiness and Preparatory Support Programme.

(d) Education, training and public awareness

218. Many developing country Parties reported on progress made in climate change education, training and public awareness. An increasing number of developing countries have integrated climate change into formal education curricula and launched new undergraduate and graduate degree programmes on climate change related matters. In some developing countries, school teachers were trained on how better to deliver the new or revised curricula, by focusing on how to make complex climate change concepts and terminology more understandable and relevant to their students. Specialized training programmes and workshops tailored to local conditions, coupled with a stronger engagement of stakeholders, were reported to have contributed to empowering local communities to enhance their climate resilience. Many developing country Parties reported notable progress in raising public awareness on climate change issues. Some developing country Parties made progress in awareness-raising within government entities in various areas and at various levels. Interministerial coordination and stakeholder engagement for the preparation of various national reports also contributed to raising awareness on climate change and the need for urgent adaptation and mitigation actions.

(e) Transparent, timely and accurate communication of information

219. Some developing country Parties highlighted that the preparation of NCs, BURs and GHG inventories had led to capacity-building benefits with regard to transferable skills for policy development, planning and other data-gathering and reporting contexts. Reported activities included training for experts on the preparation of GHG inventories, inventory improvement plans, centralized data collection and compilation mechanisms, measures to involve private sector data providers and other stakeholders, including through activities to build the capacity of institutions and industries that contribute to emissions to provide data for inventories and to guarantee the quality of those data.

220. In the area of research and systematic observation, some developing country Parties reported enhanced capacity through the establishment of policy and research frameworks, institutions, systems and networks that:

(a) Improve instruments for data collection, local observation networks and information management systems;

(b) Develop regional climate models and scenarios that can enhance technical capacity and provide opportunities to connect with the international scientific community;

(c) Train technical experts on scientific instrumentation, data analysis and quality control, and atmospheric chemistry;

(d) Support integrated MRV of GHG emissions;

(e) Offer financial support for research and development.

2. Enhancing support from developed country Parties and international cooperation for capacity-building in developing country Parties

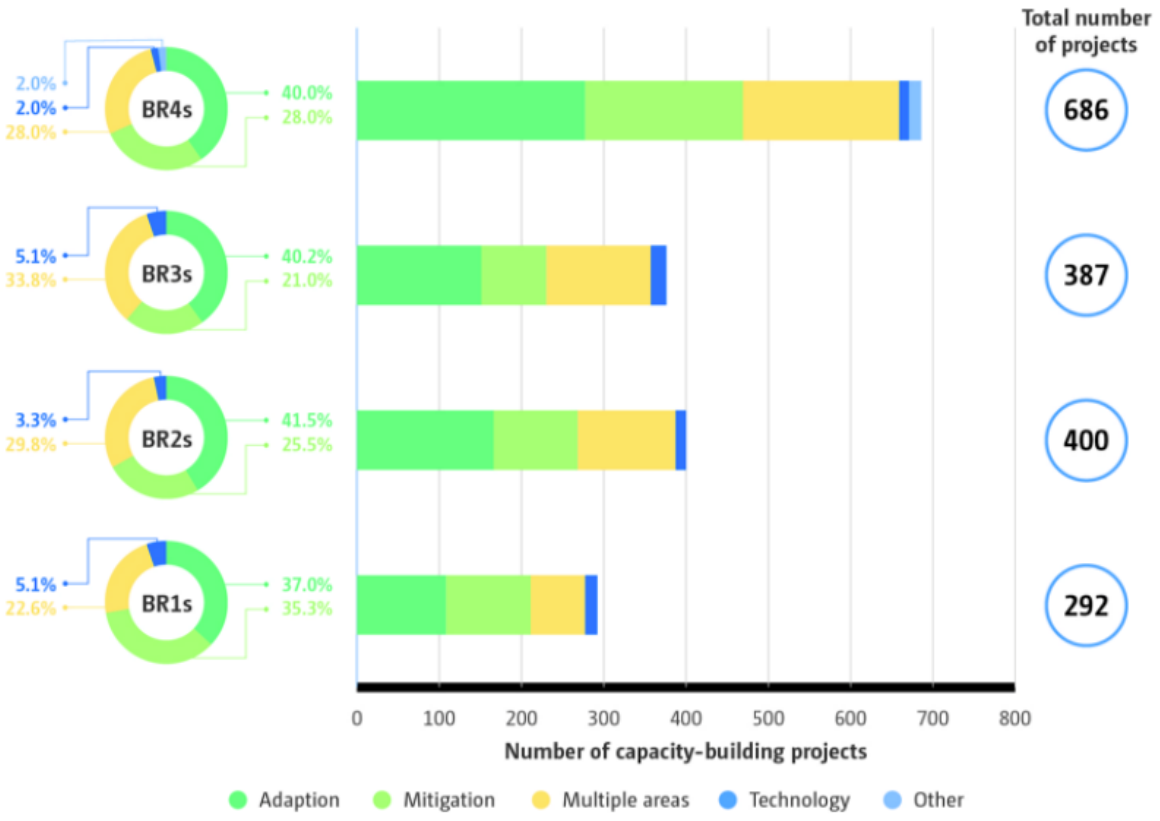
(a) Enhanced support provided by developed country Parties

221. Developed country Parties provided enhanced support for capacity-building actions in developing country Parties in line with Article 11, paragraph 3, of the Paris Agreement. The 686 capacity-building activities reported in the fourth BRs (2018–2019) represent an increase of more than 77 per cent compared with the previous reporting period (2016–2017). Most projects had been completed at the time of reporting but Parties reported their capacity-building support with varying levels of detail, with some Parties including only a few examples of capacity-building focused projects, while others included all projects that had a capacity-building component.

(i) Distribution of capacity-building support across thematic areas

222. More support was provided for capacity-building activities on adaptation (40 per cent) than on mitigation (28 per cent). Figure 32 below illustrates the distribution of capacity-building activities across thematic areas as reported in BRs.

Figure 32
Number and share of capacity-building projects by thematic area over time



223. Capacity-building support for adaptation included climate-proofing existing and new infrastructure, advancing the green transformation of agricultural and forestry practices, reducing the vulnerability of rural populations to climate risks through the introduction of insurance coverage, and fostering sustainable water resources management.

224. Capacity-building support for mitigation was primarily provided for activities aimed at strengthening measures to reduce emissions from land use, deforestation and forest degradation, and energy, as well as for carbon market readiness and GHG inventories.

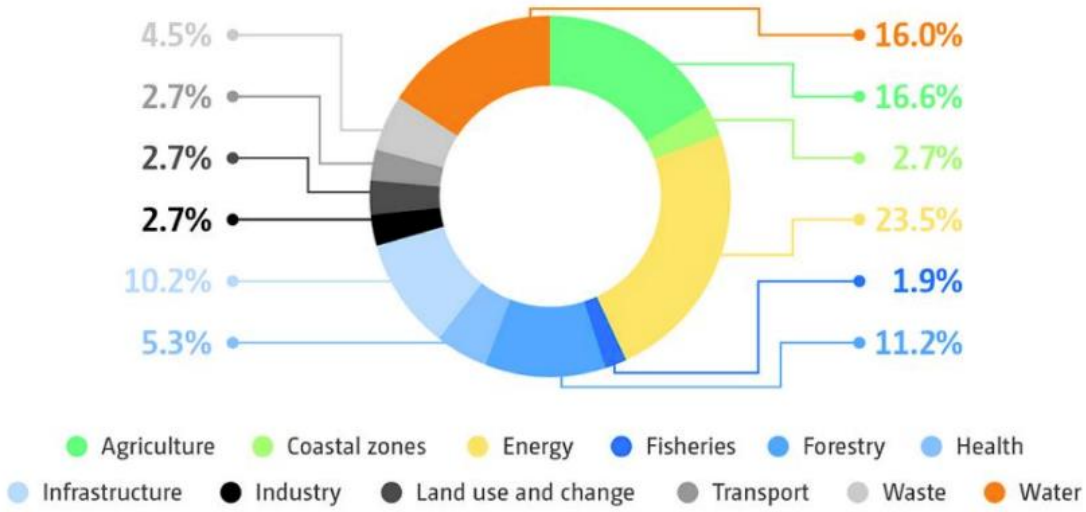
225. Many Parties reported on capacity-building activities (28 per cent) that target multiple areas, including activities related to climate change policy, education, training and public awareness.

226. Several Parties also reported on support for transparency initiatives, namely the Capacity-building Initiative for Transparency,[67] the NDC Partnership[68] and the Initiative for Climate Action Transparency.[69]

(ii) Priority sectors for capacity-building support

227. Most projects were undertaken in the areas of energy (23 per cent), agriculture (16 per cent), water (16 per cent), forestry (11 per cent) and infrastructure (10 per cent). Most energy projects focused on renewable energy and energy efficiency. Figure 33 below provides a breakdown of capacity-building activities by sector as a percentage of the total number of reported activities.

Figure 33
Share of capacity-building activities by sector as reported in fourth biennial reports

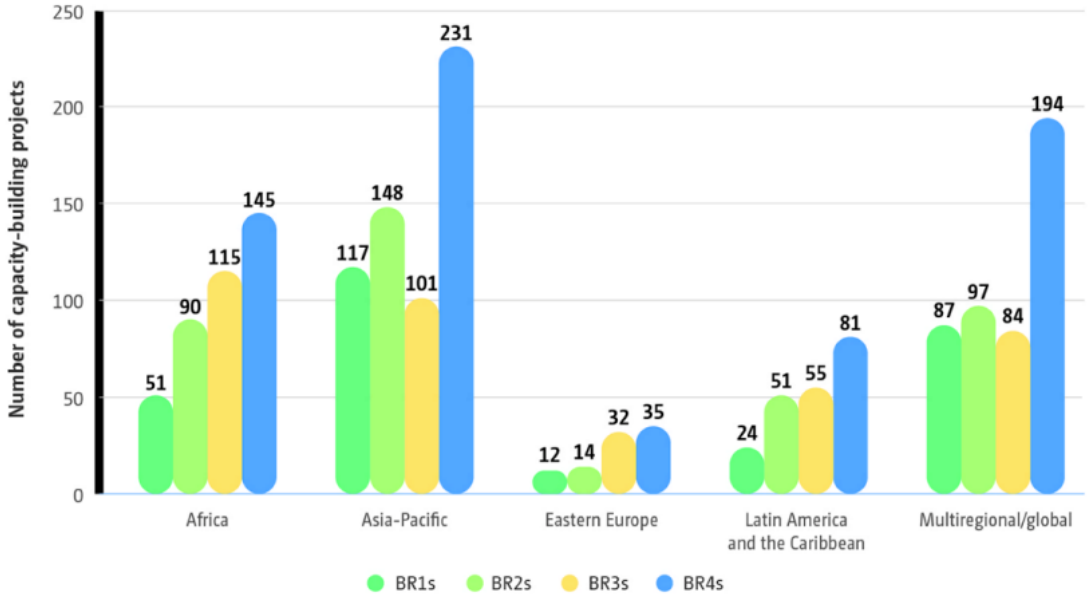


(iii) Geographical distribution of capacity-building activities

228. The Asia-Pacific (34 per cent) and African regions (28 per cent) benefited most from the capacity-building support reported in the BR4s, followed by multiregional or global activities (21 per cent), the Latin American and Caribbean region (12 per cent), and Eastern European region (5 per cent), as presented in figure 34 below.

[67] Available at https://www.thegef.org/what-we-do/topics/capacity-building-initiative-transparency-cbit.
[68] Available at https://ndcpartnership.org.
[69] Available at https://climateactiontransparency.org.

Figure 34
Number of capacity-building activities by geographical region, as reported in fourth biennial reports



(iv) Implementation channels and modalities

229. Most capacity-building activities reported by Parties in their fourth BRs were implemented through bilateral cooperation. Some Parties also reported on support for capacity-building activities implemented through the GCF and the GEF, as well as through United Nations organizations and other multilateral organizations.

230. A variety of modalities have been used in the reported capacity-building activities, including training, workshops, seminars, and short- and long-term scholarship programmes.

(b) Sharing of experiences and good practices among developing country Parties

231. In line with Article 11, paragraph 3, of the Paris Agreement, which stipulates that all Parties should cooperate to enhance the capacity of developing country Parties, some developing country Parties also reported that South–South cooperation had served as an effective voluntary instrument for enhancing capacity for climate action through sharing of experiences, good practices and lessons learned, including through regional and interregional exchange platforms and networks of developing countries. Examples of South–South cooperation on capacity-building were reported in the areas of adaptation and disaster risk management, GHG inventories, MRV and REDD+.

232. Some Parties also highlighted South–South, triangular or regional cooperation as support mechanisms for NDC implementation, including for specific aspects of financial assistance, capacity-building and technology development and transfer.

(c) Capacity-building enhanced through institutional arrangements under the Convention

233. In line with Article 11, paragraph 5, of the Paris Agreement, institutional arrangements under the Convention that serve the Paris Agreement also contributed to building capacity of developing country Parties through the provision of technical assistance, development and dissemination of tools and handbooks, and organization of technical meetings, training, workshops and online courses. Constituted bodies that have undertaken capacity-building activities are listed below with examples of their work in this area.[70]

[70] Detailed information on the capacity-building work of bodies established under the Convention is contained in documents FCCC/SBI/2021/2, FCCC/SBI/2020/2, FCCC/SBI/2019/2, FCCC/SBI/2018/3 and FCCC/SBI/2017/2.

(i) Paris Committee on Capacity-building

234. The PCCB enhanced coherence and coordination of capacity-building activities with a focus on avoiding duplication of efforts, including through collaboration with bodies under and outside the Convention. Further, it supported the identification of capacity gaps and needs, both current and emerging, and recommended ways to address them. It also promoted awareness-raising, knowledge- and information-sharing and stakeholder engagement with bodies and relevant actors under and outside the Convention. Detailed information on the work of the PCCB is contained in the synthesis report[71] prepared as a separate input to the global stocktake technical assessment process.

(ii) Adaptation Committee

235. The Adaptation Committee provided technical support and guidance on NAPs to developing country Parties, in close collaboration with the LEG and with support from the Adaptation Committee Task Force on NAPs.[72] Examples of the Adaptation Committee's capacity-building related work include the facilitation of discussions on enhanced adaptation action and the development of knowledge products and tools for developing country Parties to increase their access to technical information across a broad spectrum of adaptation-related areas.

(iii) Consultative Group of Experts

236. The Consultative Group of Experts supported developing country Parties to enhance their capacity to prepare NCs and BURs through the provision of technical assistance and support, including through the provision of training materials and the organization of webinars and regional hands-on training workshops.

(iv) Executive Committee of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts

237. The WIM Executive Committee undertook a wide range of outreach and information-sharing activities to enhance awareness and understanding of loss and damage and promote a variety of approaches to avert, minimize and address the risk of loss and damage, including through the Fiji Clearing House for Risk Transfer[73] and its interactive platform RISK TALK that bridges the demand of vulnerable countries and communities with the worldwide supply of knowledge on risk management and risk transfer.

(v) Least Developed Countries Expert Group

238. The LEG provided technical guidance and support to the LDCs on aspects related to adaptation planning and implementation, including through regional training workshops on the formulation and implementation of NAPs and through regional NAP Expos, which provide an opportunity for a wide range of stakeholders to exchange experiences and foster partnerships on NAP formulation and implementation.

(vi) Local Communities and Indigenous Peoples Platform Facilitative Working Group

239. The Local Communities and Indigenous Peoples Platform Facilitative Working Group is responsible for the implementation of the three functions of the Local Communities and Indigenous Peoples Platform related to knowledge, capacity for engagement, and climate change policy and action. The Facilitative Working Group organized a range of dialogues and training webinars to build the capacity of constituted bodies seeking to engage local communities and indigenous peoples in their work, as well as of developing country Parties, for example on the ethical application of indigenous knowledge in the context of averting, minimizing and addressing the adverse impacts of climate change.

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[71] UNFCCC PCCB. 2022. *Synthesis report for the technical assessment component of the first global stocktake*. Bonn: Germany. Available at https://unfccc.int/documents/461613.

[72] Available at https://unfccc.int/process-and-meetings/bodies/constituted-bodies/adaptation-committee-ac/areas-of-work/AC-NAPTF.

[73] Available at http://unfccc-clearinghouse.org.

(vii) Katowice Committee of Experts on the Impacts of the Implementation of Response Measures

240. KCI enhanced the capacity and understanding of Parties on the assessment and analysis of the impacts of response measure implementation to facilitate the undertaking of economic diversification and transformation and just transition. KCI prepared knowledge products, organized events, and facilitated the development, enhancement, customization and use of tools and methodologies for modelling and assessing the impacts of response measure implementation, including identifying and reviewing existing tools and approaches in data-poor environments, in consultation with technical experts, practitioners and other stakeholders. Furthermore, KCI explored approaches to inform the development and implementation of climate change mitigation strategies, plans, policies and programmes, including NDCs and long-term low GHG emission development strategies.

(viii) Standing Committee on Finance

241. The SCF addressed capacity-building issues mainly in the context of the SCF Forums, which provide a platform for a wide range of stakeholders to discuss topics related to climate finance and promote linkages and coherence in the mobilization and delivery of climate finance.

(ix) Technology Executive Committee and Climate Technology Centre and Network

242. The TEC and the CTCN contributed to capacity-building through the preparation of technical reports and policy briefs, the provision of technical assistance and the organization of workshops, thematic dialogues and forums. The TEC produced a series of publications and policy briefs that provided guidance to developing country Parties, including on the preparation of TAPs, South–South and triangular cooperation on adaptation technologies, and the enhancement of technological innovation for implementing the Paris Agreement. At the global level, the CTCN established a new capacity-building module to help countries develop a pipeline of concept notes on climate technology implementation. At the regional level, the CTCN held forums that further strengthened linkages between NDEs and NDAs, and national officials responsible for TNAs, NAPs and NAMAs to discuss country priorities and strengthen synergies to accelerate technology transfer. At the national level, the CTCN ran its Incubator Programme for the LDCs and continued to undertake capacity-building activities as part of its provision of technical assistance to developing countries that submit requests through their NDEs. The Incubator Programme was updated to include a stronger emphasis on the analysis of NDCs as a basis for the identification and prioritization of technology interventions that can support NDC objectives.

(d) Communication on support for enhancing capacity of developing country Parties

243. As stipulated in the Paris Agreement, Article 11, paragraph 4, all Parties enhancing the capacity of developing country Parties to implement the Paris Agreement, including through regional, bilateral and multilateral approaches, should regularly communicate on these actions or measures on capacity-building. Parties have reported on these matters through the BRs, BURs and NCs. However, many developed country Parties that provided support for capacity-building reported that, as capacity-building is an integral part of climate change projects, it is difficult to track and report on capacity-building efforts separately. The cross-cutting and integrated nature of capacity-building also makes it challenging to delineate the financial flows attached solely to the capacity-building component of the projects. In this context, a number of Parties mentioned a need for an internationally agreed approach to tracking capacity-building quantitatively and qualitatively in ODA in general and with regard to climate finance in particular. Furthermore, some developed countries noted a need for redesigning or better aligning national reporting guidelines for capacity-building activities and support provided in the light of the cross-cutting nature of capacity-building and for a common definition of capacity-building, so as to ensure consistent reporting across countries. Developing country Parties also noted that their limited administrative and technical capacities made it difficult to meet reporting responsibilities.

3. Capacity gaps and needs of developing country Parties

244. Despite the progress made on enhancing the capacity of developing country Parties, capacity gaps and needs for the implementation of the Paris Agreement persist. For developing country Parties, capacity-building remains vital both for the implementation of the Paris Agreement and the formulation, updating and implementation of NDCs, and for the formulation of long-term low GHG emission and climate-resilient development strategies, and transparency.

245. Most developing country Parties in their NDCs identified capacity-building as a prerequisite for achieving NDC targets, with many specifying capacity-building needs for formulating policies, integrating mitigation and adaptation into sectoral planning processes, accessing finance, and providing the necessary information for clarity, transparency and understanding of NDCs. Some Parties emphasized the importance of capacity-building in supporting institutional strengthening in order to ensure the sustainability and retention of capacities at the national level. Most capacity gaps and needs were identified in cross-cutting areas and in adaptation, including in the infrastructure, energy and health sectors and, to a lesser extent, in mitigation. Some Parties also articulated specific capacity-building needs for addressing loss and damage.

246. In addition to the reporting in their NDCs, some developing country Parties provided a more detailed account of their capacity gaps and needs by area and sector in their BURs and NCs. At the systemic level, the lack of supportive legislation or integrated implementation of existing legislation leaves important capacity gaps. Despite the notable progress on building capacity at the institutional level, including through the establishment of new government entities, organizations and research institutions focused on climate change, many developing country Parties indicated in their national reports that the capacity of institutions needs to be strengthened further and coordination between government entities needs to be improved at all levels. At the individual level, many developing country Parties referred to gaps with regard to the training of policymakers, administrative and technical experts needed to enhance capacity of government institutions responsible for handling climate change related issues. In addition, there is a need to identify solutions for retaining qualified personnel to ensure continuity and the development of institutional memory. Furthermore, many developing country Parties highlighted gaps in specific technical skills for implementing national climate change plans and programmes, in particular at the sectoral level, for example in infrastructure and industry. More specifically, developing country Parties described needs for institutional capacity-building, in particular with regard to enhancing capacity of government entities at the national level, including that of national focal points, and the subnational level, as well as of civil society organizations and the private sector, including through:

(a) Involving all levels of government and stakeholders in climate policy, promoting interministerial cooperation and stakeholder engagement, and facilitating institutional networks;

(b) Reducing inefficiencies through institutional coordination, merger or restructuring;

(c) Improving articulation and enforcement of sectoral policies;

(d) Strengthening staffing and human resources management;

(e) Providing technical and management training;

(f) Enhancing capacity to identify and access sources of support or to establish funds.

247. Developing country Parties also emphasized the lack of institutional capacity for research and development in relation to both adaptation and mitigation.

(a) Mitigation and adaptation

248. Developing country Parties identified specific capacity-building needs for the implementation of mitigation actions, including for:

(a) Development or enhancement of legal and regulatory frameworks and institutional arrangements, coordination between ministers and stakeholders, reduction of administrative complexity and improved communications;

(b) Enhancement of technical capacity, including for modelling to project GHG emissions and analyse mitigation potential and developing a mitigation baseline;

(c) Development of long-range energy alternatives planning systems and the completion of waste to energy, ethanol and utility-scale solar photovoltaic projects;

(d) Development of an environment that facilitates private sector investments in mitigation options;

(e) Sustainable soil management, water management, seedling management, integrated management of biotic stresses, selection of appropriate crops, sustainable production systems and private sector capacity to produce income-generating plantations such as shea in agroforestry systems.

249. Developing country Parties reported that institutional capacity and technical expertise are still lacking in the collection, management and use of data and in coordination among sectors and institutions in gathering and presenting national-level data. Enhanced capacity is required for:

(a) Quantifying emissions; improving estimates of emissions and removals, and accounting; and developing a mitigation baseline;

(b) Formulating guidelines on developing sectoral mitigation options;

(c) Modelling to project GHG emissions and analyse mitigation potential;

(d) Developing parameters for estimating carbon dioxide capture in the urban sectors;

(e) Conducting social assessments of public investment, enhancing coordination between the public and private sector, and gathering information to undertake feasibility studies for emission reduction activities.

250. Developing country Parties emphasized a lack of the required knowledge and competence required to undertake vulnerability and adaptation assessments; formulate and implement NAPs and other adaptation plans and programmes, including for vulnerable groups; implement regional pilot projects; carry out forecasting, risk mapping and climate proofing; address loss and damage, including through risk assessment, risk management action and risk-based recover; select and apply tools for monitoring and evaluation of adaptation efforts; and develop resilient communities, livelihoods and ecosystems.

251. With regard to capacity-building needs for vulnerability and adaptation assessment, developing country Parties highlighted the need for:

(a) Strengthening legal and regulatory frameworks and the capacity of institutions;

(b) Developing and maintaining databases on the impacts of climate change;

(c) Human resource development;

(d) Tools and methods, including technical capacity and equipment (e.g. in relation to climate models, scenarios and projections, mapping impacts, monitoring, remote sensing and using geographic information systems), and research capacity;

(e) Building capacity to assess social impacts and develop socioeconomic scenarios, assess the status of vulnerability and determine the required adaptation responses for the major development sectors and for all agroclimatic zones, vulnerable groups and ecosystems.

252. Capacity-building needs in research and systematic observation are concentrated in the areas of domestic research, technical equipment and human resources, namely:

(a) Developing integrative and systematic approaches to studying climate change;

(b) Strengthening research institutions and universities, establishing research centres, strengthening meteorological agencies, and enhancing environmental protection services and institutional cooperation;

(c) Strengthening the capacity of researchers through training; engaging with universities and research centres, centres of excellence and research networks; accessing information; and establishing postgraduate programmes on climate change.

253. In terms of capacity-building needs for adaptation, developing country Parties highlighted needs in the following areas at the national, subnational and local level:

(a) Agriculture, including sectoral scenarios and hydrological and crop models, training farmers in operations, management, retail, transportation, technology and data; strengthening agricultural training centres, regulations for soil protection, weather-indexed crop and livestock insurance, loan stimuli and tax incentives, enabling poor households to switch to better adapted species, and agroforestry;

(b) Coastal zones, including coastal zone management and erosion control, climate-proofing the design of coastal infrastructure and investments in infrastructure;

(c) Disaster risk management, including multi-hazard early warning systems, assessments, community structures for emergency response and developing disaster risk management strategies;

(d) Fisheries, including strengthening knowledge, education, awareness, logistics, monitoring capacity, institutional capacity and climate advisory expertise;

(e) Forestry, including capacity to fight fires and for reforestation;

(f) Health, including the capacity to identify and manage risks, and to evaluate the effectiveness of programmes, training, facilities and human resources, information systems and communication, databases and registries;

(g) Water, including awareness-raising, local management capacity, coordination of stakeholders, and service capacity of subnational entities.

(b) Technology development, dissemination and deployment

254. Developing country Parties highlighted capacity gaps and needs at the systemic, institutional and individual level regarding technology development, transfer, dissemination and deployment. At the systemic level, the lack of an enabling environment, including policy frameworks and market mechanisms, was often found to prevent the development and use of climate technologies in various sectors. At the institutional level, capacity gaps remain with regard to the coordination between government entities and stakeholders from academia, civil society and the private sector. At the individual level, capacity gaps and needs pertain to technical skills, know-how and awareness of policymakers, technology developers and end users. Capacity-building needs were expressed in the areas of:

(a) Standards and policy frameworks, such as energy policies to build the capacity of energy management systems;

(b) Institutional arrangements for private sector engagement;

(c) Expertise and human resource development for low-carbon technologies, including the installation, operation and dissemination of renewable energy technologies;

(d) Tools for market-led dissemination of technology;

(e) Financial support for technology development and innovation;

(f) Research capacity and expertise on efficient household appliances.

(c) Access to finance

255. Developing country Parties highlighted the need for enhanced capacity to access climate finance in general and support of the operating entities of the Financial Mechanism in particular.

(d) Education, training and public awareness

256. Developing country Parties emphasized the need for human and institutional resources, knowledge transfer, facilities and training. Capacity-building is needed for:

(a) Integrating climate change into curricula for primary, secondary and tertiary education, including through strengthening the capacity of teachers, sharing data and establishing laboratories at schools; and into training programmes and quality management systems;

(b) Accessing financial support for dedicated projects and programmes on climate change education, training and public awareness;

(c) Strengthening the capacity of higher education and research institutions to consider climate change in an interdisciplinary fashion, including in the humanities, social sciences and arts;

(d) Establishing institutions, such as a centre for education for sustainable development or a national focal point for climate change education, and an environmental communications unit;

(e) Developing methods to produce, access and disseminate climate change information;

(f) Improving skills and knowledge of the labour force through education and training, providing opportunities for the unemployed and promoting green jobs;

(g) Enhancing the awareness of society, citizens, decision makers, civil servants, non-governmental organizations, the private sector and media, on climate change, including impacts, commitments, adaptation, behavioural change, energy conservation and sustainable energy, and the importance of natural resources, science, technology and ancient and indigenous knowledge;

(h) Developing strategic plans and communication strategies to enhance public awareness and align public awareness activities with policy goals, including by assessing states of awareness, fostering information-sharing and education, and undertaking surveys with the aim of enhancing awareness, and by involving stakeholders in awareness-raising efforts;

(i) Developing information materials for local communities, including in their native languages, and organizing awareness campaigns and workshops tailored to the local population.

(e) Transparent, timely and accurate communication of information

257. Article 11, paragraph 1, of the Paris Agreement stipulates that capacity-building should enhance the capacity and ability of developing country Parties to communicate information in a transparent, timely and accurate manner. In addition, Article 11, paragraph 4, of the Paris Agreement calls on developing country Parties to regularly communicate progress made on implementing capacity-building plans, policies, actions or measures to implement the Agreement.

258. In terms of capacity gaps and needs regarding the transparent, timely and accurate communication of information under the Paris Agreement, developing country Parties highlighted needs for enhancing the capacity of institutions and individuals in charge of meeting reporting requirements at the national level and of institutions at the regional, local and sectoral levels, as well as for strengthening coordination within and among institutions. Specific needs were identified for capacity-building for various tools and methods, including the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, IPCC subcategories, country and source-specific emission factors, guidelines for quality assurance and quality control and the capacity of quality assurance and quality control units, sector-specific data generation, estimation of abatement costs, and data management to develop inventories and baselines, including arrangements to collect data, ensure quality and accuracy and validation of data.

(f) Other capacity gaps and needs

259. Some developing country Parties also highlighted capacity gaps and needs with regard to integrating cross-cutting issues into their climate actions, including gender aspects, human rights, just transition and indigenous knowledge.

260. Capacity gaps and needs in research and systematic observation focus on domestic research, technical equipment and human resources. Developing country Parties highlighted needs for:

(a) Establishing integrated and systematic approaches for studying climate change;

(b) Strengthening research institutions; establishing research centres, strengthening meteorological agencies, environmental protection services and research institutions and universities; and institutional cooperation;

(c) Strengthening the capacity of researchers through training; engaging with universities and research centres, centres of excellence and research networks; accessing information; and postgraduate programmes on climate change;

(d) Ensuring sustained funding for research and systematic observation;

(e) Strengthening availability and quality of data, in particular by:

(i) Enhancing data production through stronger hydrological, meteorological, maritime, coastal and ecosystem monitoring, and by improving high altitude observations, remote sensing and geographic information systems;

(ii) Enhancing the density and sustainability of observation sites, including Global Climate Observation System sites;

(iii) Establishing an integrated environmental monitoring network or an oceanographic data programme;

(iv) Building the capacity of meteorological services in terms of observation networks, communication systems, data acquisition and dissemination, and human resources, including in cooperation with the private sector;

(v) Improving databases, processing and storage; establishing a clearing house for climate data; and strengthening information technology skills;

(f) Increasing research capacity for data interpretation, trend analysis, scenario development and forecasting, including for various sectors;

(g) Ensuring access to models and technologies; capacity for regional, national and local modelling, and biophysical models; and modelling ecological impacts;

(h) Strengthening relevant social sciences to model socioeconomic implications of climate change and impacts of response measures.

V. Conclusions

261. With regard to the issue of finance, as also outlined by the SCF in its fourth BA, challenges and limitations remain, including with regard to collecting, aggregating and analysing information from diverse sources, although improvements have been made. These limitations need to be taken into consideration when deriving conclusions and assessing the information provided in this report in the context of the assessment of the progress made in achieving the purpose of the Paris Agreement and its long-term goals in general.

262. In addition to the findings of the SCF in the context of the fourth BA containing an overview of climate finance flows in 2017–2018, an assessment of climate finance flows, and mapping of information relevant to Article 2, paragraph 1(c), of the Paris Agreement, COP 26 and CMA 3 noted the following: global climate finance flows were 16 per cent higher in 2017–2018 than in 2015–2016, reaching an annual average of USD 775 billion; the 2017–2018 annual average of public financial support reported by Parties included in Annex

II to the Convention in their BRs (USD 52.1 billion) represents an increase of 5.7 per cent from the annual average reported for 2015–2016; the annual average amount of climate finance from the resources of MDBs to developing countries and emerging economies (USD 36.6 billion) represents a 50 per cent increase since 2015–2016; and UNFCCC funds and multilateral climate funds approved USD 2.2 billion and USD 3.1 billion for climate finance projects in 2017 and 2018, respectively.[74] Furthermore, COP 26 and CMA 3 took note of the key findings of the fourth BA, including that banks representing over USD 37 trillion in assets and institutional investors with USD 6.6 trillion in assets have pledged to align their lending and investments with net zero emissions by 2050.[75]

263. As outlined in the executive summary, further work has been mandated by COP 26 and CMA 3 to be conducted with regard to various issues, including methodological issues. Regarding progress towards achieving the goal of mobilizing jointly USD 100 billion per year, the SCF will prepare a report in 2022 for consideration by COP 27, as requested by COP 26 and CMA 3.[76]

264. In additional, as outlined in the executive summary, CMA 3 decided to initiate the deliberations on setting a new collective quantified goal, recalling decision 1/CP.21, paragraph 53, and decision 14/CMA.1, and identified the modalities and timeline for these deliberations, for work to begin in 2022 and conclude in 2024. The CMA also decided to establish an ad hoc work programme for 2022–2024, to be facilitated by co-chairs, one from a developed country and one from a developing country, appointed, in consultation with the respective constituencies, by the President of the CMA. The consideration of the new collective quantified goal will be in line with decision 14/CMA.1 and take into account the needs and priorities of developing countries and include quantity, quality, scope and access features, as well as sources of funding for the goal, and transparency arrangements to track progress towards achievement of the goal, without prejudice to other elements that will also be considered as the deliberations evolve and taking into consideration the submissions that were invited by CMA 3.[77]

265. Progress has been made by Parties in strengthening cooperative action on technology development and transfer for the implementation of mitigation and adaptation actions and the provision of support to developing country Parties for the implementation of Article 10 of the Paris Agreement. The provision of support to developing country Parties for technology development and transfer has increased significantly. Developed country Parties have more than doubled their support for technology transfer activities since 2012–2013. The technology support provided by developed country Parties encompasses support for both hardware (equipment) and software (know-how, methods, practices). The technology activities supported by developed country Parties are predominantly related to the later stages of the technology cycle, namely the deployment of mature technologies. However, support for the early stages of the technology cycle, including research and development and demonstration of new technologies, has been enhanced. Cooperative action among Parties on technology development and transfer increasingly takes place at the bilateral level.

266. More than half of the supported activities were mitigation technology activities, while support for adaptation technology activities accounted for nearly a quarter of all supported technology activities. Support for mitigation technology activities mainly focused on the energy sector, in particular renewable energy and energy efficiency. Support for adaptation technology activities mainly targeted the agriculture, cross-cutting and water sectors. Many supported adaptation technology activities in the agriculture sector were related to agricultural practices, such as seed or crop improvements, climate-smart and biological farming, or general food security improvements.

267. Despite the progress made in strengthening cooperative action on technology development and transfer for the implementation of mitigation and adaptation actions and increased support for developing countries for technology development and transfer, needs, gaps and challenges remain in achieving the long-term vision set out in Article 10 of the Paris

[74] Decision 5/CP.26 para. 3 and 10/CMA.3, para.1, adjusted to reflect latest available data.
[75] Decision 5/CP.26 para 9 and 10/CMA.3, para.1.
[76] Decision 4/CP.26, para. 19.
[77] Decision 9/CMA.3, paras. 1, 3 and 15.

Agreement. For mitigation, the most commonly reported categories of barrier to the development and transfer of the prioritized technologies reported by developing country Parties were economic, financial and technical. Within the economic and financial category, most Parties identified lack of or inadequate access to financial resources as the main barrier. In the technical category, many Parties identified system constraints, insufficient expertise, and inadequate standards, codes and certification as the main barriers. For adaptation, almost all Parties reported the following categories of barrier to the development and transfer of the prioritized technologies: economic and financial; policy, legal and regulatory; institutional and organizational capacity; and human skills. Within the first two categories, Parties identified lack of or inadequate access to financial resources and insufficient legal and regulatory frameworks as the main barriers.

268. Progress has been made on enhancing the capacity of developing country Parties to implement the Paris Agreement. An overview of progress in this area is presented in section C.1 above, in line with the thematic areas outlined in Article 11, paragraph 1, of the Paris Agreement, namely mitigation and adaptation; technology development, dissemination and deployment; access to finance; education, training and public awareness; and the transparent, timely and accurate communication of information. However, developing country Parties continue to face urgent capacity gaps and needs in all of the aforementioned thematic areas, as demonstrated in section C.3 above.

269. Section C.2 above shows that developed country Parties have provided enhanced support for capacity-building and that international cooperation on capacity-building for developing country Parties also includes both South–South and regional cooperation approaches. However, given that reporting on capacity-building related activities both from developed country Parties and developing country Parties remains limited and a range of different reporting approaches are used by Parties, any trends in support for capacity-building can only be taken as indicative, as comprehensive and comparable data remain unavailable.

270. Institutional arrangements supporting the implementation of capacity-building under the Paris Agreement remain limited to the policy and advocacy work of the PCCB. In 2019, the CMA adopted a decision on "initial institutional arrangements for capacity-building under the Paris Agreement"[78], which reconfirmed the mandate, priority areas and activities assigned to the PCCB by the COP, but provided no further guidance with regard to the provisions of the Paris Agreement on capacity-building, including in its Article 11. The achievements of institutional arrangements for climate finance and technology under the Paris Agreement have shown the importance of clear implementation arrangements, for example on technology through the technology framework, and the key role that national focal points play as interlinkages between those institutional arrangements under the Paris Agreement and the national level. Compared with institutional arrangements on finance and technology under the Paris Agreement, there is a notable absence of an implementation arrangement for capacity-building.[79]

[78] Decision 3/CMA.2.

[79] UNFCCC PCCB. 2022. *Synthesis report for the technical assessment component of the first global stocktake*. Bonn: Germany. Available at https://unfccc.int/documents/461613.

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