

Technical report on indicators for measuring progress achieved towards the targets referred to in paragraphs 9–10 of Decision 2/CMA.5

23 May 2025

I. Introduction

1. Under the UAE-Belém work programme on indicators, technical experts were convened by the Chairs of the Subsidiary Bodies to assist in the technical work. Following a compilation and refined mapping of indicators, CMA 6 invited experts to prepare a consolidated list of indicator options and a progress report.

2. SB 60 provided a range of mandates for the convening of the experts and the technical work that followed, and also requested the secretariat, with input from the technical experts, to prepare technical reports, including through work at virtual meetings, containing a list of proposed new indicators for assessing overall progress towards achievement of the targets. Following the refined mapping of indicators, CMA 6 invited experts to finalize and submit their inputs to the technical reports to enable their publication four weeks prior to SB 62. This technical report is an overview by the secretariat of the substantial volume of work done by the experts. This technical report is based on inputs from each group's technical report, which included information on their progress and the methodologies they used. It also incorporates each group's contributions to the consolidated list of indicator options. The experts' outputs are considered in relation to the mandates from SB 60 and CMA 6, in particular:

(a) The invitations to experts outlined in decision 3/CMA.6,¹ paragraphs 10 and 26;

(b) The criteria outlined in the SB 60 conclusions² and in decision 3/CMA.6 paragraph 17.

3. Whilst this report is designed to provide an overview, the experts' technical reports³ and the full consolidated list of indicators and metadata⁴ should be read in conjunction to ensure a comprehensive view of the work done.

4. This report primarily covers the work conducted by experts in the period between CMA 6 (November 2024) and May 2025. In this period, five virtual meetings, to which all experts were invited, were convened and a hybrid expert meeting and workshop were organized in March 2025.⁵ Both the virtual expert meetings and the workshop enabled experts to take stock of the progress made by different groups, discuss approaches to their work, and address a range of other topics. These activities helped advance their work. In addition, the experts self-organized many virtual meetings within their groups and conducted numerous hours of offline work to prepare the outputs outlined above.

¹ Decision 3/CMA.6.

² FCCC/SBSTA/2024/7, paragraph 41, FCCC/SBI/2024/13, paragraph 79.

³ Available <https://unfccc.int/topics/adaptation-and-resilience/workstreams/global-goal-on-adaptation/experts-informal-progress-reports-november-2024-uae-belem-work-programme>.

⁴ Available <https://unfccc.int/documents/647049>.

⁵ Workshop report, available at: <https://unfccc.int/documents/645739>.

II. Overview of the technical work done by experts

A. Common approaches

5. All expert groups have completed a preliminary review of the indicators, based on the criteria (a) and (b),⁶ ahead of CMA 6.⁷ CMA 6 encouraged experts to apply common approaches and methodologies in the review and refinement process.⁸ In line with this, experts followed common approaches that involved unpacking targets into sub-components, mapping indicators under sub-components, reviewing them against the criteria from SB 60⁹ and CMA 6,¹⁰ prioritizing indicators, developing new indicators to address identified gaps, and documenting the information. There was broad alignment among expert groups in adopting common approaches, though variations emerged in their application.

2. Unpacking the targets

6. The experts began their review by unpacking their respective targets and identifying subcomponents for each. While most targets were fully unpacked, few included modifications or omissions from the original mandate language. This does not necessarily affect the indicator framing, nor does it imply that the subcomponents are inadequately covered. The subcomponents identified by each group are as follows:

<i>Target</i>	<i>Mandate</i>	<i>Sub-components</i>
9a. Water supply and sanitation	Significantly reducing climate-induced water scarcity and enhancing climate resilience to water-related hazards towards a climate-resilient water supply, climate-resilient sanitation, and access to safe and affordable potable water for all;	(i) Significantly reducing climate-induced water scarcity, (ii) Enhancing climate resilience to water-related hazards, (iii) Towards a climate-resilient water supply, (iv) Towards a climate-resilient sanitation, and (v) Access to safe and affordable potable water for all
9b. Food and agricultural production	Attaining climate-resilient food and agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all;	(i) Production, (ii) Supply and distribution, and (iii) Access and nutrition
9c. Health impacts and health services	Attaining resilience against climate change related health impacts, promoting climate-resilient health services and significantly reducing climate-related morbidity and mortality,	(i) Changing morbidity and mortality associated with climate-sensitive hazards, and (ii) Progress towards delivering climate-resilient health systems

⁶ In this report, the criteria are referred to by their corresponding subparagraph letter in documents [FCCC/SBSTA/2024/7](#), para. 41, and [FCCC/SBI/2024/13](#), para. 79. Here, criterion (a) refers to the relevance of the indicators to measuring progress towards one or more of the targets referred to in paras. 9–10 of decision [2/CMA.5](#) and criterion (b) refers to the specific relevance of the indicators to adaptation, including enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change.

⁷ Available at <https://unfccc.int/documents/640965>.

⁸ See decision [3/CMA.6](#), para. 13.

⁹ See documents [FCCC/SBSTA/2024/7](#), para. 41(c)-(i), and [FCCC/SBI/2024/13](#), para. 79(c)-(i).

¹⁰ See decision [3/CMA.6](#), para. 17 (a)-(e).

	particularly in the most vulnerable communities;	
9d. Ecosystems and biodiversity	Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystems;	(i) Reducing climate impacts on ecosystems and biodiversity, (ii) Accelerating ecosystem-based adaptation (EbA) and nature-based solutions (NbS), (iii) Management, (iv) Enhancement and restoration, and (v) Conservation and Protection
9e. Infrastructure and human settlements	Increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimizing climate-related impacts on infrastructure and human settlements;	The indicator list addresses the sub-components outlined in the mandate, though not explicitly labelled as sub-components. Instead, the main indicators are labelled as sub-components in the consolidated list, which requires clarification to better understand the indicators under each sub-component
9f. Poverty eradication and livelihoods	Substantially reducing the adverse effects of climate change on poverty eradication and livelihoods, in particular by promoting the use of adaptive social protection measures for all;	(i) Poverty eradication, (ii) Livelihoods, and (iii) Adaptive social protection measures
9g. Cultural heritage and knowledge	Protecting cultural heritage from the impacts of climate-related risks by developing adaptive strategies for preserving cultural practices and heritage sites and by designing climate-resilient infrastructure, guided by traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems;	(i) Impacts of climate-related risks on cultural heritage, (ii) Adaptation strategies developed to protect and preserve different cultural heritage sites, and (iii) Implementation of climate-resilient adaptation responses for cultural heritage
10a. Impact, vulnerability, risk assessment	Impact, vulnerability and risk assessment: by 2030 all Parties have conducted up-to-date assessments of climate hazards, climate change impacts and exposure to risks and vulnerabilities and have used the outcomes of these assessments to inform their formulation of national adaptation plans, policy instruments, and planning processes and/or strategies, and by 2027 all Parties have established multi-hazard early warning systems, climate	(i) "by 2030 all Parties have conducted up-to-date assessments of climate hazards, climate change impacts and exposure to risks and vulnerabilities", (ii) (by 2030 all Parties) "have used the outcomes of these assessments to inform their formulation of national adaptation plans, policy instruments, and planning processes and/or strategies", (iii) "by 2027 all Parties have established multi-hazard early warning systems", and (iv) (by 2027 all Parties have

	information services for risk reduction and systematic observation to support improved climate-related data, information and services;	established) “climate information services for risk reduction and systematic observation to support improved climate-related data, information and services”
10b. Planning	by 2030 all Parties have in place country-driven, gender-responsive, participatory and fully transparent national adaptation plans, policy instruments, and planning processes and/or strategies, covering, as appropriate, ecosystems, sectors, people and vulnerable communities, and have mainstreamed adaptation in all relevant strategies and plans;	(i) “by 2030 all Parties have in place country-driven, gender-responsive, participatory and fully transparent national adaptation plans, policy instruments, and planning processes and/or strategies, covering, as appropriate, ecosystems, sectors, people and vulnerable communities”, and (ii) (by 2030) “have mainstreamed adaptation in all relevant strategies and plans”
10c. Implementation	by 2030 all Parties have progressed in implementing their national adaptation plans, policies and strategies and, as a result, have reduced the social and economic impacts of the key climate hazards identified in the assessments referred to in paragraph 10(a) above;	(i) “by 2030 all Parties have progressed in implementing their national adaptation plans, policies and strategies”, and (ii) “and, as a result, have reduced the social and economic impacts of the key climate hazards identified in the assessments referred to in paragraph 10(a) above”
10d. Monitoring, evaluation and learning	by 2030 all Parties have designed, established and operationalized a system for monitoring, evaluation and learning for their national adaptation efforts and have built the required institutional capacity to fully implement the system;	(i) “by 2030 all Parties have designed, established and operationalized a system for monitoring, evaluation and learning for their national adaptation efforts”, and (ii) “and have built the required institutional capacity to fully implement the system”

3. Mapping indicators against sub-components

7. Expert groups mapped their indicators to the identified sub-components within the targets. This process facilitated a more structured assessment of indicator coverage across sub-components and enabled the identification of key gaps.

8. While all groups began work in 2025 with the refined indicators that were published prior to CMA 6, some found this starting point not ideal. For instance, one group supplemented the existing compilation with critical reflection on what ideal indicators should look like for each component. They noted that their output should be viewed as the best achievable one given the constraints of the process and the available time and resources. Another group highlighted that the extended focus on the initial compilation of indicators hindered meaningful progress in developing adequate indicators. Given their familiarity with available indicators and their strengths and limitations, the group felt that suitable indicators could have been identified more efficiently without focusing so heavily on that initial list.

4. Modifying indicators or developing new indicators

9. After mapping existing indicators to target sub-components, groups proposed modifications to existing indicators, primarily to improve alignment with the targets, and, where necessary, developed new indicators.

10. Most groups adopted an approach that built on existing international frameworks, modifying indicators to address gaps and align them with the GGA. Commonly referenced frameworks include the Sustainable Development Goals (SDGs), the Sendai Framework for Disaster Risk Reduction, and the Kunming-Montreal Global Biodiversity Framework (GBF). These indicators benefit from well-established metadata and available data sources. However, the experts noted that these indicators in their original form may not fully capture adaptation-specific dimensions.

11. While the groups considered indicators relevant to both criteria (a) and (b) during their second stage of review, some indicators identified as relevant to criterion (a)—i.e., alignment with their targets—were not explicitly framed to reflect relevance to criterion (b), which pertains to adaptation, including enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. To address this, many groups recommended extending and disaggregating indicators to better reflect climate adaptation needs.

12. Groups modified indicators from the original list of submissions, including those derived from established frameworks, for example:

(a) For the indicators under the food target, the existing SDG indicator 1.3.1, *“Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work injury victims and the poor and the vulnerable,”* was modified to: *“Proportion of population covered by social protection floors/systems, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work injury victims and the poor and the vulnerable (disaggregated by statutory/non-statutory programmes), by age, sex, geographic location (high climate-risk exposure) and nationals/non-nationals”*. This revision added three additional layers of disaggregation to enhance adaptation relevance;

(b) For the adaptation cycle indicators, minor modifications were made to some existing indicators, adjusting them to reflect a climate-specific context rather than a disaster-specific context. For example, the Sendai indicator G-5- *“Number of countries that have accessible, understandable, usable, and relevant disaster risk information and assessment available to the people at the national and local levels-”* was modified to: *“Number of Parties that have accessible, understandable, usable, and relevant climate risk information and comprehensive risk assessment available to the people at the national and local levels,”* by replacing *“disaster risk”* with *“climate risk”*.

13. For the water indicators, although no modifications were made to the indicators in the original list, inputs were provided in the column titled *“Description of how the indicator needs to be modified”* within the submission template, outlining how the indicators could be adjusted to better align with the adaptation context. For example, the suggested modification for the SDG indicator 6.5.2, *“Proportion of transboundary basin area with an operational arrangement for water cooperation”* is to consider building on existing reporting mechanisms for SDG 6.5.2 and further developing indicators relating to data and information exchange (including joint alarm systems for water-related hazards) and development of joint or coordinated plans to address the transboundary impacts of climate change. These suggested changes have not yet been incorporated by the experts but are expected to be addressed in the next stage of the process. Several groups have noted gaps in methodology development, typology classification, and metadata completeness, which may require technical supplementation prior to submission to CMA 7.

14. Several expert groups consolidated similar indicators into broader main indicators or headline indicators to streamline assessment and improve coherence. These headline indicators capture overarching themes, while associated sub-indicators provide disaggregated or specific elements to support more detailed monitoring and analysis. For example:

(a) The headline indicator “*Capacity building and knowledge transfer for climate change adaptation in food and agriculture sector*” aims to assess the status of knowledge transfer, awareness raising, training, advocacy, research and capacity building actions towards adaptation in the food and agriculture sectors. To support this, sub-indicators include: (i) *Number of agricultural producers receiving extension services to support climate change adaptation* (ii) *Number of agricultural populations reached through capacity building interventions (disaggregated by age, gender, actor type, e.g., producer, processor, distributor)* (iii) *Value of investments for research and development for adaptation in food and agriculture* (iv) *Proportion of research and development programs integrating indigenous and traditional knowledge on climate change adaptation in food and agriculture*;

(b) The headline indicator “*Number of Parties that have conducted up-to-date assessments of climate hazards, climate change impacts and exposure to risks and vulnerabilities*” focuses on enhancing the understanding of climate risk through conducting comprehensive risk assessments, systematic collection of data on observed impacts of climate-related events, development of risk profiles, and ensuring that traditional knowledge, Indigenous Peoples’ knowledge and local knowledge are incorporated into risk information systems. To support this, sub-indicators include: (i) *Number of Parties that have accessible, understandable, usable and relevant climate risk information and comprehensive risk assessment available to the people at the national and local levels* (ii) *Number of Parties having national tracking systems for observed climate-related hazardous events and impacts* (iii) *Number of Parties with risk profiles including climate hazards, climate change impacts and exposure to risks and vulnerabilities that consider different temperature scenarios* (iii) *Number of Parties with traditional knowledge, Indigenous Peoples’ knowledge and local knowledge systems integrated into their risk information systems.*

5. Reviewing and prioritizing the indicators

15. Groups reviewed and prioritized the indicators based on the criteria outlined in SB 60 and CMA 6. Different groups adopted different internal review processes, with some involving all experts in the review of all indicators, while others divided tasks among experts or used individual assessments, followed by group validation. Examples include:

(a) One approach involved applying a scoring formula to rank the indicators in descending order. Final selection was based on expert judgment, guided by these scores;

(b) Another approach considered indicators suggested by all experts, including those proposed by only one expert. Indicators supported by a single expert were retained to reflect the diversity of expertise and perspectives. However, the group noted that further discussion is needed to reach consensus and identify areas of commonality;

(c) In some cases, a two-stage review process was followed: experts first shortlisted indicators individually and then compared their selections in a group setting to build consensus. For example, in one group, each expert initially identified 20 key indicators, which were later cross-checked collectively. Similarly, in another group, six experts each submitted their top selections. Within these lists, each expert aimed to pick a limited number of (e.g., less than 10) relevant indicators.

16. Some groups reported engagement with external stakeholders during the process, while others may have done so but did not mention it in their reports. Additionally, some groups noted that they were unable to conduct a thorough external peer review due to time constraints.

6. Documenting the indicators

17. During the Bonn workshop in 2025, experts initiated discussions on developing a common template to capture indicator details. Through collaborative efforts, they created an indicator submission template that included fields for; a new indicator ID, classification as a main or sub-indicator, final indicator name, references to the original indicator list (i.e.,

original ID and title), sub-components, expert groups that selected the indicator, its relevance to other groups and other relevant metadata.

18. Using this template, the groups provided relevant information for each indicator, including the rationale for inclusion, available metadata, data collection status, units of measurement, relevance to Means of Implementation (MOI), and criteria for selection where such information was available. In the rationale section, many groups included additional insights on the indicator's relevance to the GGA targets and adaptation dimensions (criteria (a) and (b)). Some information was not provided due to time constraints, with plans to collect the missing details in subsequent stages of the work.

19. Some groups added additional columns to the template to capture more information:

(a) One group has conducted a detailed assessment of indicators and provided an indicator matrix with additional information. The matrix includes a brief analysis of the indicator's relevance towards the GGA (based on criterion (b)), an evaluation of their strengths and limitations in tracking progress, and recommendations for their application and further refinement;

(b) Another group has included, in addition to measurement units, the threshold and optimal values for certain indicators;

(c) One group has included additional details such as the function of each indicator and the nature of information required, whether quantitative or qualitative.

20. Certain groups included entries that function more as headline statements rather than fully defined indicators, highlighting the need for better indicator structure and content. To address such structural issues, a technical quality assurance process may be undertaken to ensure that indicators meet basic definitional and formatting standards.

21. Although the submission template included columns to provide details on indicator modifications, only some of the groups that modified their indicators provided the relevant information. The level of detail in the submissions also varied considerably, ranging from minimal notes to comprehensive explanations.

(a) One group indicated the extent of modification for each revised indicator, categorizing them as either moderate or significant. It was explained that moderate modifications typically involved small textual adjustments to improve adaptation relevance (e.g., changing "disasters" to "climate-related disasters") or to broaden applicability (e.g., using "population" instead of "targeted population" or "children"). Significant modifications included developing new indicator proposals to represent the intent of several submitted indicators;

(b) Information on whether the indicators were modified, and details of any such modifications, was not available for some groups at the time of reporting.

22. All groups provided information in the template on whether the indicator is relevant to other targets, except one group, which requested a multi-day in-person workshop to discuss this with other groups.

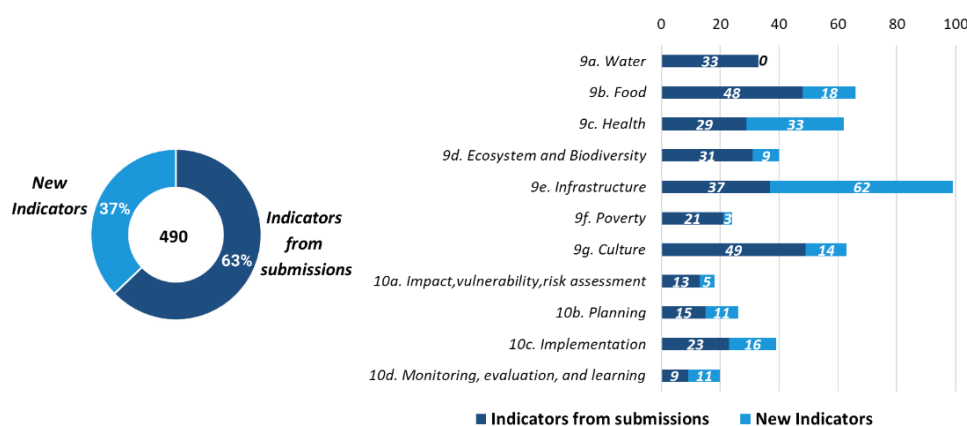
B. New indicators

23. "New indicators" refer to those not included in the original compilation, but this does not necessarily imply they are all newly developed. These may include pre-existing indicators that were not in the initial compilation. For example, the adaptation cycle indicator "Number of Parties having national tracking systems for observed climate-related hazardous events and impacts" was not in the original compilation and is therefore classified as a new indicator, although it already exists under the Early Warning for All (EW4All) initiative.

24. Some new indicators are significantly modified versions of those in the original list or are closely aligned with them. For example, while the original list from the poverty group included indicators on migration and displacement, these were found to be difficult to measure. As a result, an alternative indicator was proposed to reflect countries' preparedness

to manage displacement impacts from climate-related disasters: “Proportion of countries that have a national disaster risk reduction strategy with specific provisions for addressing the displacement impacts of climate-related disasters.”

25. The charts below summarize newly developed indicators across groups. One group conducted a detailed assessment of the indicators, identified gaps and highlighted the need for new indicators, documenting these in both the submission template and a detailed indicator matrix. However, the actual modification or creation of new indicators is suggested to take place in the next stage. For now, the current list retains only the original indicators, accompanied by notes for proposed modification.



26. Groups have also developed new indicators that are not pre-existing to fill gaps they found after mapping the existing indicators to identified sub-components. While the initial list for food and agriculture included an indicator on agricultural insurance, it primarily focused on access. As a result, experts proposed supplementary indicators to capture other critical dimensions such as the availability and diversity of insurance products, as well as their effectiveness. In proposing new indicators, some groups cross-checked existing frameworks including the SDGs and the Sendai Framework, to avoid duplication. Where relevant indicators were not found, new ones were developed.

27. Some groups noted that the gap assessment was not conducted systematically and would require a more detailed process, which may lead to the identification of additional new indicators.

28. Additional information on data sources, methodologies, and related parameters for the proposed new indicators remains to be collected. Most groups have made preliminary efforts to include such details in their current submissions. For example, one group has developed some new quantitative indicators and included information on Optimal Value and Threshold Values to clarify what successful implementation looks like and guide policy and practice toward clearly defined targets. These values serve as benchmarks; the optimal value represents the highest level of ambition or full realization of a goal, while threshold values indicate critical minimums below which adaptation outcomes may be inadequate, ineffective, or inequitable. For example, the group proposed a new indicator “ % of identified at-risk cultural heritage sites with adaptation measures implemented” with an optimal value of “100% of identified at-risk sites” and threshold values “70% (acceptable progress); 90% (high performance)”.

C. Enhanced collaboration and identifying synergies

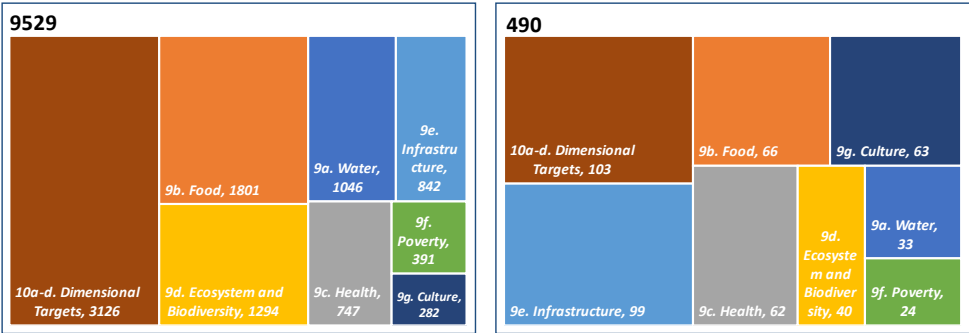
29. As outlined in the progress report,¹¹ experts enhanced their collaboration across the groups throughout 2025. The groups exchanged their approaches during expert meetings to ensure alignment in their approaches and confirmed that their methodology was broadly consistent with others, reflecting a shared approach to reviewing and selecting indicators.

¹¹ Available <https://unfccc.int/documents/645725>

This was particularly prevalent during the workshop, with some experts participating in other target group discussions where there were synergies. For example, there were discussions between the cultural heritage experts and the planning experts on how Indigenous peoples and cultural heritage could be nested in some of their indicators under planning for adaptation, and if there was a need for more cross-cutting indicators that could usefully include such factors as gender and Indigenous Peoples.

30. As has been discussed throughout the work programme, there are numerous synergies across the targets, and subsequently the indicators too. For example, there are clear interlinkages between water and health, or poverty and infrastructure. In column G of the consolidated list of indicators, experts indicated what other target areas a given indicator could be relevant to.

D. Reducing the numbers



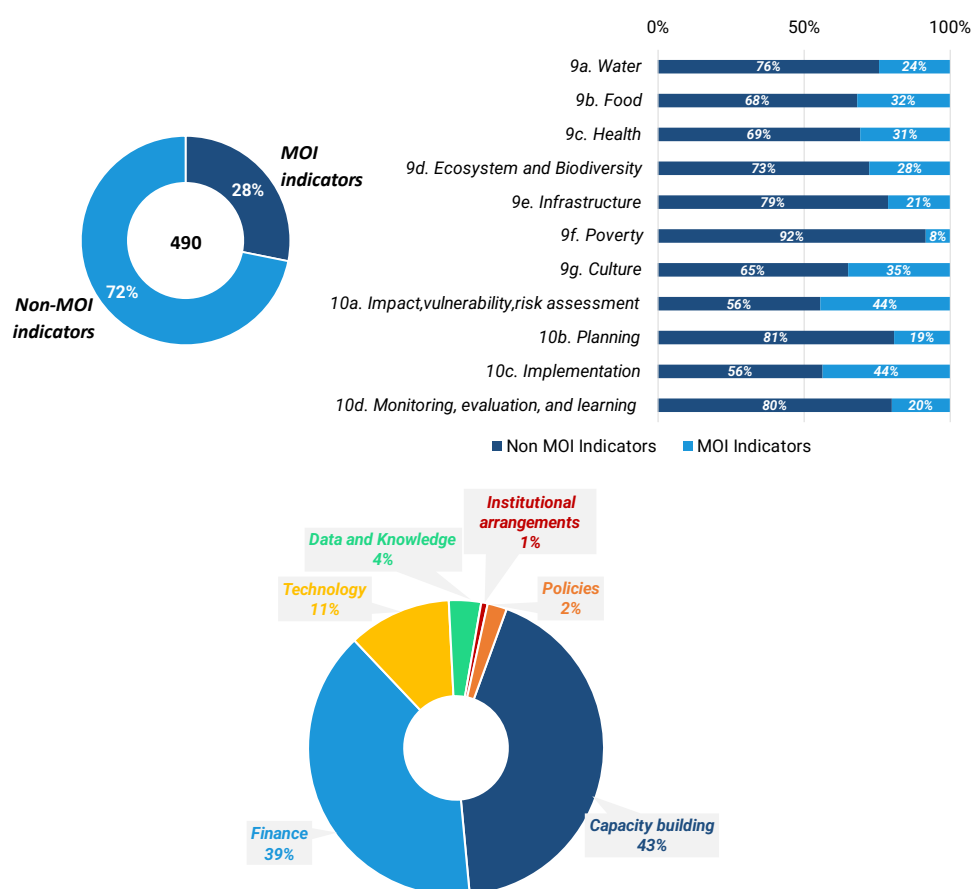
31. The initial compilation of indicators, based on submissions from Parties, observer organizations, and the Adaptation Committee, comprised 9,529 indicators. The initial list contained duplicates, and after their removal, the list was reduced to approximately 7,000 indicators. Following the intensive and extensive work undertaken by the experts, a consolidated list has been prepared, comprising 490 indicators distributed across 11 targets. To ensure coherence, usability and alignment across targets, a technical refinement process may be useful to harmonize indicator formatting, metadata completeness, typology classification, and cross-target disaggregation.

32. It is also important to note that, among the 490 indicators in the current list, 182 are newly developed and were not present in the initial compilation. This means the number of retained indicators from the original list is 308. Of these 308, many have been modified or supplemented with sub-indicators to better align with the GGA targets.

33. Some groups noted that their work was guided by paragraph 10(c) of decision 3/CMA.6 and the broader decision. They focused on identifying globally relevant indicators and emphasized the potential for aggregation.

34. In several cases, multiple indicators were merged or restructured as sub-indicators under broader, consolidated main/headline indicators. One group reviewed 83 indicators and grouped similar ones into 13 broad, universally applicable main/headline indicators and 53 sub-indicators, supporting global aggregation. When considering only the main indicators, the count stands at 288, with 202 sub-indicators grouped under them.

E. Indicators for enabling factors for implementation, including MOI



35. An analysis of the indicators across targets shows that 28% are related to enabling factors of implementation, including MOI, with components such as finance, capacity building, technology transfer, data and knowledge, institutional arrangements, and policies. A major share of the MOI indicators are focused on capacity building and some examples include indicators such as *Number of trained healthcare professionals on climate and health adaptation (beyond Ministry of Health staff)*, *Number of Parties receiving or mobilizing international support for NAP formulation*, *Percentage of the target population with skills improved by capacity building interventions that have implemented adaptation actions, by sex; age; people with disabilities; migrants and displaced people; Indigenous Peoples; and profession across the GGA targets*.

36. All groups included indicators related to finance in their lists, covering various aspects such as public and private finance, subsidy and credit schemes, grants, international funding, cost savings, etc. Some examples include *Proportion of agricultural population with access to credit schemes for climate risk management (disaggregated by gender [crops, livestock, fisheries, forestry], location)*, *International public funding, including official development assistance for conservation and sustainable use of biodiversity and ecosystems*, *Total extent of private finance flows into relevant Infrastructure and Human Settlement (IHS) adaptation needs*, and *Amount of funding allocated for conservation efforts of historic places*.

37. Indicators related to technology covered topics like early warning systems, hazard and risk exposure maps, tracking systems, climate and weather observations, and so on. Some examples include *Proportion of countries that have conducted and updated technology needs assessments to support the achievement of the UAE Framework for Global Climate Resilience*, *Number of early-warning systems installed*, *% of at-risk heritage objects digitized*

for preservation as a climate risk contingency, Number of Parties having national tracking systems for observed climate-related hazardous events and impacts.

38. There are indicators related to enabling factors of implementation, such as data and knowledge, institutional arrangements, and policies, in the list. Some examples include *number of countries with operational data and tracking systems for assessing adaptation actions and results in food and agriculture, number of countries integrating climate change adaptation priorities for food and agriculture into national and subnational adaptation strategies, including NAPs and NDCs, number of countries with climate change coordination units incorporating the food and agriculture sector.*

39. One group highlighted that although the importance of MOI is recognized, time constraints prevented a detailed exploration of MOI indicators. Another group noted that the identified MOI indicators should be reviewed in coordination with experts working on related targets to ensure coherence and completeness.

F. Consideration of the criteria by experts

40. In reviewing and refining the indicators and preparing the consolidated list of options, experts applied a range of criteria mandated by CMA 6 and SB 60 to guide their selection. However, during the workshop, they also highlighted the complexities and practical challenges involved in applying these criteria. Below is the criteria and an overview of how experts interpreted and used them throughout the process. Experts completed the review based on criteria (a) and (b) from the SB 60 conclusions, ahead of CMA 6.¹²

41. Paragraph 17 of 3/CMA.6 recalls the criteria for potential indicators set out in the conclusions of the subsidiary bodies at their sixtieth sessions and identifies the following additional criteria for possible consideration by the experts referred to in paragraph 1 above, as appropriate:

- (a) The measurability and availability of data enabling the transparent monitoring of progress;
- (b) The ability to use data that are already available or can be easily collected by countries, including data from international databases and standardized reporting practices;
- (c) The use of metrics where baselines exist;
- (d) The relevance to multiple thematic targets;
- (e) Outcome and output orientation.

42. FCCC/SBSTA/2024/7, para. 41, and FCCC/SBI/2024/13, para. 79: The SBSTA and the SBI also agreed that the mapping referred to in paragraph 39 above may consider:

- (a) The relevance of the indicators to measuring progress towards one or more of the targets referred to in paragraphs 9–10 of decision 2/CMA.5;
- (b) The specific relevance of the indicators to adaptation, including enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change;
- (c) Whether quantitative and/or qualitative information applies to the indicators;
- (d) Data availability for the indicators;
- (e) The ability of the indicators to reflect regional, national and local circumstances;
- (f) The applicability of the indicators across different contexts;
- (g) The ease of interpretation of the indicators;
- (h) The clarity of methodologies associated with the indicators;

¹² See para.5 in this document.

(i) The ability of the indicators to be aggregated across levels and disaggregated by demographic and socioeconomic characteristics, such as vulnerability, gender, age, disability, race, socioeconomic status, and status as Indigenous Peoples, as appropriate and depending on national circumstances;

(j) The indicators' basis on the best available science;

(k) The indicators' basis on traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems;

(l) That the indicators should not be used as a basis for comparison between Parties.

43. Across all expert groups, **availability and measurability of data** as well as associated methodologies were considered in line with the mandate from decision 3/CMA.6 (paragraph 17(a)), namely on the measurability and availability of data, the ability to use data that are already available or can be easily collected by countries and the use of metrics where baselines exist, and as well as SB 60 conclusions.¹³ Examples of such considerations are as follows:

(a) Some experts introduced a tier classification of indicators: Tier 1 indicators are highly relevant and already established within global frameworks or widely monitored, while Tier 2 indicators are relevant but not yet widely reported or are context dependent;

(b) For the selected indicators of the poverty and livelihoods target, 63% of the indicators already have metadata available, though some require updates to reflect modifications;

(c) Other experts prioritized indicators with existing methodologies and metadata, noting that qualitative indicators can be easily converted to quantitative measures using yes/no checklists. These indicators draw on national and local-level data and emphasize usability and data collection feasibility;

(d) Some experts noted a mix of data availability and existing reporting mechanisms. In cases where indicators align with existing efforts, such as data collected by UN Women for target 10A—custodian agencies were identified. However, for indicators linked to NAPs, AdComms, or BTRs, data exists but is not standardized, and some indicators still lack metadata and data collection entirely.

44. Across indicators under targets, varying levels of data readiness and methodological reflection were reported as referred to the criterion in paragraph 17 (b) of 3/CMA.6. Some experts have included metadata and noted opportunities for expansion following guidance from SB 62 while others have also recommended a phased approach to allow refinement of metadata and methodologies. Some experts emphasized the need for clear and consistent baselines, which are largely absent, and underscored the importance of monitoring systems that incorporate longitudinal and systemic indicators. Other experts have not yet grouped indicators by data readiness, but efforts to assess metadata and data collection have been suggested by experts as a possible next step following SB 62.

45. In line with the criterion in paragraph 17 (c) of 3/CMA.6 on the use of metrics where baselines exist, one group of experts noted that tracking progress requires clear and consistent baselines, which are lacking in most of the submitted metrics.

46. Regarding the relevance to multiple thematic targets as outlined in paragraph 17 (d) of 3/CMA.6, there were several indicators considered by experts to be **relevant to multiple targets**.

47. One group acknowledged the links to several thematic targets, including ecosystems (as it relates to "...restoration and conservation and the protection of terrestrial, inland water..."); food and agriculture (agriculture accounts for the majority of global freshwater use), health (relevance of safe water for preventing water-related diseases) and (water-related)

¹³ [FCCC/SBSTA/2024/7](#), para. 41 (d) and (h), and [FCCC/SBI/2024/13](#), para. 79 (d) and (h).

Infrastructure. They noted that whilst the current list of indicators does not systematically analyse cross-cutting aspects with other targets, it includes indicators relevant to areas like food, health, ecosystems, and infrastructure.

48. Similarly, the infrastructure group noted that access to critical infrastructure and basic services such as water and healthcare is cross-cutting and also appears under targets like water, health, and poverty. Elements such as nature-based Solutions (NbS) and ecosystem-based Solutions (EbS) are cross-cutting with the ecosystems group, infrastructure standards, zoning regulations, and related measures intersect with the target on culture and indicators on MOI intersect with dimensional targets.

49. The poverty group explained that despite clear conceptual interlinkages between the poverty target and other targets, systematic cross-referencing is still pending. For example, the current set of indicators for poverty does not yet track the integration of poverty, livelihoods, and social protection considerations in the adaptation cycle. Similarly, the cultural heritage experts noted that many of the indicators focused on the implementation of adaptation strategies and had clear links to targets such as 10c (Implementation) and 10b (Planning), but this has not yet been fully explored.

50. Regarding the adaptation cycle, as outlined, and shown in the consolidated list, many indicators under the thematic targets are also linked to the dimensional targets. However, in the consolidated list, these are included under the thematic targets, and thus most indicators under 10a-d are indeed specific to these targets.

51. Experts considered **indicator orientation (input, process, output, outcome, impact)** in line with the criterion in paragraph 17(e) of decision 3/CMA.6. The inclusion of outputs and outcomes-type indicators is more prominent for some targets, reflecting a focus on assessing tangible results and the effectiveness of adaptation actions. One group ensured representation across all types under each of their respective targets' components and that for each component, there is at least one indicator of each type (input, process, output, outcome). It was explained that in many cases, the distinction between, for example, output and outcome, is not clear-cut, and the categorization can sometimes change depending on the description of the indicator. Some experts called for further typology clarification.

52. In terms of **indicator type** (SB 60 conclusions),¹⁴ the experts across most thematic and dimensional targets prioritized quantitative indicators. Approximately 70% of water and infrastructure indicators, and around 90% of poverty and ecosystem indicators, were quantitative. All food-related sub-indicators were reported as quantitative. The adaptation cycle experts similarly emphasized quantitative metrics (e.g., population proportions, country counts), though a small number of qualitative indicators were also included. In cultural heritage, experts acknowledged the limitations of quantitative assessments for culture and addressed this by proposing qualitative checklists convertible to quantitative formats. Some experts selected quantifiable indicators with clearly defined targets and margins of success to ensure actionability and effective tracking.

53. Regarding **context and scale** (SB 60 conclusions),¹⁵ experts aimed to ensure that indicators are both globally relevant and adaptable to diverse national and local contexts. Examples include:

(a) Water experts used a tiered structure to distinguish global from context-specific indicators;

(b) Food and agriculture experts have headline indicators that are broad and universally applicable, allowing for global aggregation, with specific flexible indicators that countries can choose to report on as relevant to their national contexts;

(c) Infrastructure experts included a mix of regional, national, sub-national, and local levels to enhance understanding of indicator coverage. For example, the list includes a national-level indicator—*Number of country NAPs which include temperature goal*

¹⁴ [FCCC/SBSTA/2024/7](#), para. 41(c), and [FCCC/SBI/2024/13](#), para. 79(c).

¹⁵ [FCCC/SBSTA/2024/7](#), para. 41(e) and (f), and [FCCC/SBI/2024/13](#), para. 79(e) and (f).

overshoot in adaptation scenarios for IHS—and a local-level indicator—*Extent of municipalities with climate change adaptation plans that explicitly integrate a consideration of the impact of Paris Agreement temperature goal overshoot*. They also sought to reflect different contexts through sub-indicators. For example, the indicator *Population residing in areas expected to cross Critical-Adaptation-Threshold Exposure (CATE) (Exposure of country population to key tipping points)* has sub-indicators that disaggregate information by Greenland Ice Sheet, West Antarctic Ice Sheet, Arctic Sea Ice, Amazon Rainforest, among others;

(d) As for the poverty and livelihoods experts, their indicators reflect diverse ecological systems, enabling nuanced analysis across scales. Poverty experts combined global SDG-aligned metrics, such as SDG 1.3.1 on social protection coverage and SDG 8.3.1 on informal employment, with newly developed, context-sensitive indicators;

(e) Adaptation cycle experts included many indicators, which begin with ‘number of countries...’, which can aggregate national progress to a global picture. One example of this would be: ‘*Number of Parties that have established a system for monitoring, evaluation and learning for their national adaptation efforts*’;

(f) Cultural heritage, health and ecosystem experts included indicators that are applicable to any country and context and are often not area specific.

54. In terms of consideration of **criterion (i)**, while many expert groups recognized the importance of disaggregating indicators by demographic and socioeconomic characteristics (e.g., gender, age), the application was inconsistent across target areas. For example, some:

(a) Proposed indicators or sub-indicators that allow for equity-sensitive analysis;

(b) Made specific reference to gender-responsiveness;

(c) Included indicators focusing on Indigenous Peoples and local communities and the rate of implementation of adaptation strategies for cultural heritage. For example, “*Share of Indigenous Peoples and local communities, [disaggregated by gender, age, people with disabilities, migrants and displaced people] made aware of climate change risks to cultural heritage and appropriate responses for reducing climate change impacts to cultural heritage*” focuses on disaggregation for different groups. This would also address the considerations of cross-cutting indicators that could be applicable to other targets;

(d) Included disaggregation by disaster type or sector, but lacked socioeconomic breakdowns critical for capturing differential vulnerabilities;

(e) Included age and gender but overlooked other vulnerable groups (e.g., people with disabilities, migration status, Indigenous Peoples).

55. Experts highlighted that disaggregation variables have not been selected systematically, which can result in critical factors being omitted. A standardized approach is needed to ensure consistent, meaningful representation of intersecting vulnerabilities across targets.

56. The groups’ inclusion of cross-cutting considerations is further elaborated upon in their technical reports and is outlined in their consolidated list.¹⁶

III. Noteworthy practices observed across submissions

57. Across the different expert groups, there were several good practices highlighted which contributed to the consolidated list.

58. Several groups ensured their processes were both transparent and inclusive. For example, by giving all experts the opportunity to put forward indicators for consideration, before using a group approach to decide on inclusion in the consolidated lists. One group

¹⁶ Available at <https://unfccc.int/documents/647049>.

documented the review against all components of their respective target and criteria from SB 60 and CMA 6, as well as preserving and documenting the diversity of expert opinions, highlighting a wide range of perspectives and knowledge systems, and transparently identifying shortcomings.

59. In addition to using the template agreed by experts during the Bonn workshop, one group presented their indicators using a user-friendly matrix, mapping their relevance towards the different components and categorizing them by type (input, process, output, outcome). The matrix also highlighted whether an indicator measures enablers and MOI, provides an analysis of its strengths and weaknesses to track towards the targets and provides recommendations for their use and further refinement as needed.

60. One group used an approach involving the construction of theories of change or pathways for the target, offering a structured method for linking vulnerability contexts, adaptation actions, measurable outcomes, and long-term results.

61. One group paid particularly close attention to include provisions for cross-cutting considerations and disaggregation, as well as a mix of quantitative and qualitative indicators when considering existing indicators and developing new ones to fill gaps. For example, one indicator, “*Share of Indigenous Peoples and local communities, disaggregated by gender, age, people with disabilities, migrants and displaced people made aware of climate change risks to cultural heritage and appropriate responses for reducing climate change impacts to cultural heritage*” is included, with two supporting sub-indicators.

62. One group explained that a dual-layer approach, distinguishing global and contextual indicators, is essential for balancing universal relevance with national specificity. Global indicators provide a framework for measuring progress across countries, ensuring consistency and international cooperation in measurements, whilst at the same time, contextual indicators offer flexibility, allowing countries to address unique national circumstances and priorities. This approach ensures that the proposed list of indicators remains robust and coherent while enabling tailored responses to local adaptation challenges, fostering more effective and inclusive climate action.

63. One group noted that the existence of multiple reference frameworks was helpful in shaping a comprehensive and coherent approach, as it helped prevent gaps in the indicator list without requiring adherence to a single, more rigid framework at this stage. In addition, they highlighted that the thematic unpacking exercise allowed for a more balanced prioritization of indicators across dimensions.

IV. Challenges and gaps identified by experts

64. All groups noted that, given the complexity of this process, there were several **challenges** faced, both in relation to substance and process. Some of these were encountered and highlighted by several groups, whilst others were raised by specific groups.

65. As per the mandate,¹⁷ experts were invited to **address gaps** and identify new indicators as needed. As outlined above, many groups included modified and new indicators in the consolidated list; however, in their reports, many also highlighted other challenges that presented themselves during the work, with many overlaps between the two. A full list of challenges and gaps, including areas within specific targets where no indicators currently exist, can be found in the technical reports.¹⁸

66. In relation to substance:

(a) Several groups noted the challenge of bridging between **measuring adaptation at the global level and its context specificity**. For example, the water group noted that the **lack of globally agreed frameworks or definitions for water resilience**

¹⁷ Decision 3/CMA.6, paragraph 26(a).

¹⁸ Available at <https://unfccc.int/topics/adaptation-and-resilience/workstreams/global-goal-on-adaptation/experts-informal-progress-reports-november-2024-uae-belem-work-programme>.

complicates the selection of comprehensive global indicators and that data gaps and measurement inconsistencies in many countries for existing indicators create obstacles in developing a balanced set of indicators. It was also noted that there is a lack of disaggregated data to identify inequalities, limiting the ability to assess resilience at a granular level, with the food group highlighting that although the indicators aim for aggregation, not all are supported by existing data systems, and some remain aspirational in scope. Finally, the cultural heritage group highlighted the difficulty of quantifying intangible cultural heritage when selecting indicators;

(b) Several expert groups highlighted the **challenges surrounding indicator type**, with one noting that further alignment is needed to ensure even distribution across input, process, outcome, and impact indicators, and the need to integrate under-addressed elements such as governance, equity, and social vulnerability. It was also noted that there was ambiguity in handling indicators that could be both outcome and vulnerability indicators;

(c) It was noted by one group that there are **gaps in indicators related to social inclusion** (especially for youth, Indigenous Peoples, and persons with disabilities), and that there is a limited inclusion of Indigenous Knowledge and local knowledge systems, with gaps in tracking long-term changes and linking social and ecological dynamics. In addition, other groups note the underdevelopment of MOI indicators, with one suggesting that the balance between qualitative and quantitative approaches remains unresolved, and while checklists offer a promising approach, further methodological development is needed;

(d) One group noted that developing indicators was challenging due to the **complex interlinkages across sectors** like energy, transport, housing, water, and health, where adaptation actions in one domain may have unintended consequences in another. Similarly, another group explained that clustering indicators into thematic groups was complicated by overlaps, as some indicators logically fit into multiple categories. Additionally, it was suggested that the multi-scalar nature of governance creates interdependencies and complicates outcome attribution and metric design, especially for slow-onset events and systemic risks that accumulate over time or manifest across scales;

(e) Throughout the process, and as was also reflected in the experts' reports, the lack of clarity on the 'end objective' made prioritization more ambiguous. For example, some submitted indicators were more related to monitoring and evaluating the outputs, outcomes and impacts of specific adaptation projects or plans, while others related to national-level indicators that provide statistical information on the general level of resilience at the country-level. It was noted that there is a certain ambiguity about which ones of these should be prioritized, which is important to resolve as this has implications for who is responsible for collecting and reporting the indicators, which in turn has implications for the development of the indicator;

(f) Several groups noted the **varying quality of inputs** and associated challenge of reviewing inputs that were not in fact indicators, which were rather vague statements or questions, and often not relevant to adaptation or the targets. In addition, it was highlighted that the lack of clear definitions posed a risk of divergent judgements on an indicator's inclusion and relevance, and that there were also challenges in how to approach standardized disaggregation by factors like gender and age.

67. In relation to the process;

(a) It was noted that groups have identified indicators relevant to multiple targets; however, due to time constraints, they have not coordinated with other groups to address overlaps. Most expert work was conducted virtually; however, due to the extreme time zones across the pool of experts, it was challenging to get all experts to join calls at one time, with many joining meetings during the middle of the night, leading to difficulties in coordination. Some experts noted that due to these pressures, some information and data presented in the consolidated list are not as comprehensive as it could be, and that further discussions in relation to interlinkages across targets would be beneficial to the process, given the insufficient cross-target harmonization;

(b) One group highlighted that the lack of a clear authority for decision making on technical issues, the process, interim timelines and format of outputs meant that 78 experts had to self-organize to reach consensus decisions whilst working on a voluntary basis. This meant that the time available to identify suitable indicators has been limited, especially given tight timelines.

V. Suggestions by experts on possible ways forward

68. In the experts' technical reports, all groups provided suggestions, including on next steps for this work, to address gaps, further refine the consolidated list, as well as for the use of the indicators following CMA 7. For a full list, please refer to the experts' technical reports,¹⁹ however, some themes included:

(a) Experts highlighted the importance of more collaboration across targets, particularly to strengthen cross-cutting indicators, improving the standardization of definitions and methodologies and ensuring a consistent understanding of key concepts. One group emphasized the value of a phased, iterative approach to indicator development and recommended further sectoral consultations post-SB 62 to refine language, methodologies, and data sources. It was also suggested that any final submission of indicators and methodologies be reviewed and approved by all expert groups to ensure alignment;

(b) Refining the selected indicators and clarifying metadata was a widely shared recommendation. This includes ensuring transparency around definitions, methodologies, agreed baselines, and data sources. With the consolidated list now prepared, experts proposed that gaps such as inconsistent data sources be systematically addressed. One recommendation was the establishment of an online database or information platform to house metadata, share data sources;

(c) Provide opportunities for wider stakeholders e.g., academia, civil society, and practitioners, to review and provide comments on the indicators list. Another suggestion was to collaborate with international and national statistics agencies to explore the use of already existing official statistics, the standardization of definitions, classifications and methods, and to consider established data collection processes;

(d) It was highlighted that existing indicators with clear methodologies and alignment to global frameworks are highly feasible for immediate use. Newly proposed indicators, particularly those addressing community awareness, ecosystem-based adaptation, and digital safeguarding, fill critical gaps but require further methodological development and data support. Some experts suggested a dynamic, inclusive process that allows updates based on scientific and technical progress;

(e) One group underscored the need for cross-cutting indicators and the inclusion of transboundary and systemic risk dimensions and that key takeaways include the benefit of using headline-sub-indicator structures and embedding theory of change logic into indicator selection. Experts also encouraged the development and integration of regionally specific indicators into global frameworks, using inclusive approaches such as the Earth systems (ocean, continents, cryosphere, atmosphere) or ecosystem-type perspectives to ensure both local relevance and global comparability. The importance of integrating climate hazard contexts directly into indicator design was suggested, as was developing indicators using climate data to enhance interpretability was also highlighted;

(f) Some noted that limited data availability should not preclude the inclusion of new indicators. Instead, guidance should be developed to support such indicators in the interim. In this context, one group pointed to the need for technical support to developing countries on indicator development and reporting, emphasizing that clear methodologies must accompany such support;

¹⁹ Available at: <https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction-to-adaptation-and-resilience/loss-and-damage/reports-by-technical-experts-uae-belem-work-programme-may-2025>.

(g) Another group reflected that while indicators are essential, they rarely capture the full picture of adaptation progress, even within the specific element they address (e.g., the proportion of homes exposed to sea-level rise), as progress often results from interconnected actions across systems. Therefore, indicators should inform judgment rather than serve as standalone measures and should be interpreted collectively to reflect the broader system-level progress and gaps in adaptation.
