Summary of the third workshop under the Glasgow–Sharm el-Sheikh work programme on the global goal on adaptation: Methodologies, indicators, data and metrics, monitoring and evaluation

4 November 2022

I. Introduction

A. Mandate

1. The Conference of the Parties serving as the meeting of the Parties to the Paris Agreement decided, at its third session, to establish and launch a comprehensive two-year Glasgow–Sharm el-Sheikh work programme on the global goal on adaptation to start immediately after that session and to be carried out jointly by the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI). It also decided that four workshops should be conducted per year, with the support of the secretariat and under the guidance of the Chairs of the subsidiary bodies.[1]

2. SB 56 requested the secretariat, under the guidance of their Chairs, to prepare a summary of each workshop, in the context of preparing a single annual report on the workshops,[2] for consideration at SB 57, capturing progress and informing subsequent considerations by Parties under the work programme.[3]

B. Proceedings

3. The third workshop under the work programme[4] was held in a hybrid format from 17 to 18 October 2022 and broadcast live on YouTube,[5] with more than 200 registered in-person and virtual participants.

4. The workshop opened with welcoming remarks from the Chair of the Subsidiary Body for Scientific and Technological Advice, Tosi Mpanu Mpanu, United Nations Development Programme resident representative, Alessandro Fracassetti and Her Excellency Dr. Yasmine Fouad, Minister of Environment of the Arabic Republic of Egypt.

5. On the first day, the participants discussed themes of a global perspective such as global-level targets and indicators, including facilitated breakout group discussions. On the second day, the discussion focused on the regional, national and local levels. The Chair of the Subsidiary Body for Implementation, Marianne Karlsen, closed the workshop with concluding remarks.

II. Summary of discussions

A. Global perspective

6. The workshop examined how other multilateral review mechanisms function under related conventions, processes and frameworks, and their journeys in setting baselines and defining goals.

[1] Decision 7/CMA.3, paras. 2–4 and 12.
[2] As per decision 7/CMA.3, para. 16.
[3] FCCC/SBSTA/2022/6, para. 159, and FCCC/SBI/2022/10, para. 192.
[4] The concept note and agenda for the workshop, and all presentations are available at https://unfccc.int/topics/adaptation-and-resilience/workstreams/glasgow-sharm-el-sheikh-WP-GGGA.
[5] See https://www.youtube.com/playlist?list=PLtD6YOC_kbMh-WBsuy-XwJV7_KJ2o-fj-.

7. The secretariat set the scene by summarizing the mandate for the Glasgow–Sharm el-Sheikh work programme, salient points from the first workshop and possible indicators, approaches, and metrics that have appeared in previous reports. The presentation also provided several examples of forward-looking approaches, including the four-tier approach of target setting, outlined the challenges of both long-term goal-setting and extrapolation from the present, and concluded with possible discussion points and questions for consideration.

8. A representative of the United Nations Office for Disaster Risk Reduction (UNDRR) presented on the lessons learned from the monitoring process under the Hyogo Framework for Action. Among them were the limitations of focusing too heavily on monitoring outputs as opposed to outcomes (considerable progress in governance and preparedness mechanisms (output), yet increasing disaster losses and damages (outcome)). This led to the Sendai Framework for Disaster Risk Reduction 2015–2030 being more outcome oriented (in which the success or failure of disaster risk reduction measures is determined through a decrease or increase in disaster impact). Reporting burdens on countries are also minimized as the Sustainable Development Goals (SDGs), the Samoa Pathway and the New Urban Agenda 'borrow' indicators from the Sendai Framework.

9. The Intergovernmental Panel on Climate Change (IPCC) representative's presentation focused on concepts, approaches and indicators to guide adaptation. Examples included 'burning embers' diagrammes assessing aggregate risk reduction at the regional and sectoral level. These can be used to present different risk levels in conjunction with increased warming under different adaptation scenarios (limited, incomplete and proactive adaptation). The presentation also discussed data aggregation and data availability as key considerations in identifying what types of data are available and where, and where knowledge might still persist. While many countries have monitoring and evaluation applications, these are still at early stages, whereas 170 countries have adaptation-related policies.[6]

10. The IPCC presentation also noted the need to consider limits to adaptation, including why and at what temperature levels these limits are reached. Awareness of such limits could be useful in tracking the effectiveness of adaptation, including economic; social/cultural; information, awareness and technology; human capacity; financial; and governance, institutional and policy.

11. A representative of the World Meteorological Organization (WMO) spoke of extreme events in the past decade hindering national progress towards achieving the SDGs in connection with the work WMO is doing on adaptation. One area of such work is early warning systems; less than half of all countries currently have early warning systems in place. WMO is collaborating with key partners to deliver on the UN Secretary General goal on EWS within the coming five years.

12. The Food and Agriculture Organization of the United Nations (FAO) presented on essential SDG metrics to assess progress towards the Glasgow–Sharm el-Sheikh work programme, with a focus on agriculture and food security indicators. The presentation included a comparison of the monitoring frameworks of the SDGs, the Sendai Framework and the Paris Agreement, with respect to quantitative goals or targets at the global level, development of a global monitoring and evaluation framework, and the adaptation objectives mentioned within them. It outlined the drivers of vulnerability, resilience and adaptive capacity and the SDGs that cover them. The FAO experience of supporting Guatemala in developing a system of monitoring, evaluation and reporting specific to agriculture was highlighted. It was pointed out that under the Glasgow–Sharm el-Sheikh work programme, countries will benefit from the advantages of relying on statistical information that is collected through other relevant international agreements, whose indicators can be easily compared. It will also reduce reporting burdens and be useful in reporting under the enhanced transparency framework and in compiling data for the biennial transparency report. Specific goals and indicators discussed are contained in annex I.

[6] See IPCC. 2022. *Climate Change 2022: Impacts, Adaptation and Vulnerability*. *Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. p.20.

13. The FAO presentation described the lessons learned regarding identifying indicators that reflect what is happening at the field level while being relevant for reporting at the national and international level. This involves extensive stakeholder consultation, stocktaking of policies and ongoing programmes, and building on existing data and experience from other programmes, such as the Adaptation Fund, the Green Climate Fund and the Global Environment Facility. The FAO is also working on existing monitoring and evaluation frameworks within national ministries, ensuring that reporting is facilitated at different levels. It is also investing a great deal of effort in the building of existing initiatives for data collection, data management and coordination with key sources of information.

14. The United Nations Statistics Division (UNSD) presentation focused on recent methodological developments in measuring climate change vulnerability and adaptation, based on the experience of developing a programme on climate change statistics at UNSD, a process which took more than 10 years. The final Global Set,[7] meant as a framework to be used by countries when preparing their own sets of climate change statistics and indicators, was adopted in 2020. It contains 158 indicators accompanied by 190 statistics, all nested within 34 topics. Methodological soundness is lowest for adaptation indicators in all regions, and highest for drivers. Data availability is the most challenging for the adaptation indicators in all regions. The grouping by policy area is not mutually exclusive and many indicators belong to more than one area. The Global Set is meant to help to streamline the supply of data for national policies and international reporting by mapping the commonalities, overlaps and gaps under multiple policy demands and statistical methods and guidelines. Criteria for the selection of indicators include consistency with existing thematic indicator sets and guidance, namely from UNFCCC/IPCC, FAO, SDGs, UNDRR, the United Nations Convention to Combat Desertification and the Convention on Biological Diversity, as well as with the Framework for the Development of Environment Statistics, and complementarity with existing regional climate change indicators.

1. Existing approaches and baselines in reviewing adaptation

15. Discussions on existing approaches were framed around baselines.

16. One participant suggested that the point of reference does not necessarily need to be a classical baseline. Some participants pointed out that country priorities could be the starting point of a baseline and a goal at the global level, when aggregated from existing sources of information within and beyond the UNFCCC process, combined with projections; this could address the nationally determined specificity of the adaptation process. Similarly, it was also suggested that actions and plans in nationally determined contributions (NDCs), adaptation communications and national adaptation plans (NAPs) could be aggregated and compiled in a way that identifies the many commonalities and convergences in the various sectors to develop a baseline as well as a goal.

17. One participant emphasized that, owing to context specificity, anything related to adaptation that went beyond what was nationally determined or anything that countries themselves did not decide on would be hard to quantify or aggregate.

18. Some participants discussed the interplay between needs-based approaches and risk-based approaches in setting baselines and goals and assessing progress on adaptation.

19. One participant suggested that vulnerability and adaptation indicators by UNSD could provide insight into measuring the existing vulnerability and adaptive capacity of populations across many socioeconomic areas at the baseline level.

20. Another suggestion was to look to existing examples to inform the development of a baseline, such as that of the UNDRR established baseline for early warning system coverage, which could inform the new Secretary General's initiative on early warning systems for all, or of the WMO baselines for extreme climatic events from 2011 to 2020 and their connection to the SDGs.

[7] See https://unstats.un.org/unsd/envstats/climatechange.cshtml.

21. Some participants suggested setting the baseline based on the desired outcome, with one questioned the purpose of the baseline and starting by mapping the outcome and working backwards from there. Similarly, another participant felt it important to identify the ultimate goal and work backwards from there, applying a theory of change perspective.

22. One participant suggested that one aspect to consider in terms of both indicators and baselines was how countries' systems were performing, a possible indicator being the number of countries with monitoring and evaluation systems in place. They also suggested looking at mainstreaming adaptation or ensuring that it was being taken up in sectoral policies, as well as having effective institutional frameworks or governance frameworks for adaptation in countries. Baselines could be expanded to include underlying drivers of vulnerability, which went beyond the UNFCCC process and were linked to broader development and poverty reduction efforts.

23. From their experience, one participant noted that even the baseline around disasters was imperfect, in particular with respect to challenges around measuring impacts, areas which require further work.

24. It was emphasized that the Glasgow–Sharm el-Sheikh work programme should add no extra reporting burdens to countries' existing obligations beyond what has been agreed on under the Convention and the Paris Agreement, with one participant emphasizing the need to build to the extent possible on the baselines from existing frameworks to tackle underlying drivers of vulnerability.

25. Support for adaptation was discussed throughout the workshop. A key theme was the inadequacy of current support levels, as well as challenges relating to access to finance and ensuring finance flows to where it is needed. Measuring adaptation finance as an indicator or set of indicators (alongside technology transfer and disbursement of funds) and considering it in the context of baselines were discussed.

2. Forward-looking and aspired state approaches

26. There were some deliberations on goal-setting and exploring the deeper fundamental assumptions about the future, for example, the four-tier approach to the Glasgow–Sharm el-Sheikh work programme, that could facilitate finding common ground for global and national goals and shared ambition as to what constitutes a well-adapted global community.

27. In this regard, a new holistic approach was explored, outlining a principle of setting aspirational goals around well-being that suggested that global-level targets should have as their pillars food security, water, biodiversity and health; a possible indicator concerns food security, namely ensuring global-level access to food with a view to reducing vulnerabilities in the future. Existing relevant targets under SDG indicators 1.5.4 and 2.C.1 were identified.

28. One participant highlighted that an aspired state of adaptation should take into account the transboundary impacts of climate change and the reimagination of the global commons, citing the example of the hydrological cycle and unequal distribution of water supplies. This tied in with several other participants' views that some existing indicators would need to be tweaked, for example, to reflect resource allocation, with UNFCCC and the work under the Glasgow–Sharm el-Sheikh work programme playing a central role in this.

29. One participant highlighted the global nature of the Glasgow–Sharm el-Sheikh work programme, stating that while it is important to have locally led metrics and indicators, it is also important to move beyond that and focus on something that would be relevant for the work programme and its collective nature, and as such should have aspirational targets that address its three objectives of the GGA. They suggested a target of 50 per cent of vulnerable populations made resilient by 2030, rising to 100 per cent by 2050, as well as the expansion of coverage of early warning systems, which, it was later noted, is in line with the UN Secretary-General's goal of universal coverage by such systems within the next five years.

30. One participant considered that the GGA was forward looking, and that adaptation did not have an end point but was cyclical, making determining the aspired state of being adapted not only unachievable but also undesirable.

31. Many participants had common views on using starting points in the form of international frameworks and their various monitoring and reporting processes and mechanisms, from which goals, indicators, targets, framing and baselines could be derived or evolved, and from which to begin thinking about the Glasgow–Sharm el-Sheikh work programme. These included the Sendai Framework, the SDGs and other related conventions, as well as all the reporting elements under the UNFCCC, including NAPs, NDCs, adaptation communications, national communications, biennial update reports and biennial transparency reports, and related analyses such as needs assessment reports and others produced outside the UNFCCC process. It was suggested that a mapping exercise be carried out on all the above to make clear what information is available, in order not to duplicate already existing efforts and not to reinvent the wheel.

32. One participant highlighted the needs determination report [8] by the Standing Committee on Finance, as being a good source from which to determine the priorities of developing countries and use as a baseline; this, combined with other documents that reflect the finance needed, provides a snapshot of aspirations. Such tools could provide a realistic basis on which to set an aspirational goal based on existing needs. In a similar vein, another participant felt that the Glasgow–Sharm el-Sheikh work programme should be an aggregation of different information and that the measurement of risks, impacts or adaptive capacities should be conducted in a nationally determined manner and then translated into financial needs.

33. Similarly, another participant felt that bringing together the four-tier thresholds of adaptation goal-setting, the SDGs, and the Sendai Framework, along with NDCs and NAPs, could set the basis for further developing the Glasgow–Sharm el-Sheikh work programme.

34. Several participants supported including a target for adaptive capacity, as it would have an impact on the overall vulnerability of a system or region, with one suggesting it as a way of understanding the situation in the interim while working through the challenge of measuring outcomes and impacts of adaptation efforts, and another suggesting using resilience attributes as a way to measure adaptive capacity.

3. Measuring outcomes and outputs

35. Participants distinguished between process-related indicators and those focused on outcomes. The presentation on the history of the Sendai Framework, for example, illustrated that relying solely on output or process indicators risks meeting targets but failing to achieve the main objective of reducing disaster impacts in the end.

36. Several participants acknowledged the difficulties in measuring something as complex as adaptation, noting that they see adaptation as more of a process with no end point. Several mentioned the difficulty in coming up with meaningful indicators at any level, some questioned establishing targets, seeing output/process indicators as sufficient, while others considered output/process and outcome indicators equally important. Some process indicators suggested included whether there was a national climate change risk assessment available, where there was a monitoring and evaluation system in place, and whether there was an adaptation plan in place, addressing the most important risks, which could work on a global level and take care of diversity.

37. One participant considered the key themes from the presentations as outcome-focused, and that it is important that the outcomes are reflected in the approaches taken. There is a need to set some targets, in a similar way to the SDGs and the Sendai Framework approaches. It was reiterated by many participants over the course of the workshop that the approach should not start from scratch but, rather, the existing frameworks should be used.

38. Participants recognized that there is no ‘one size fits all’ solution, given the diversity of climate change impacts, data availability, technology and technological possibilities. A mixed approach is needed, taking into consideration that not all countries have monitoring

[8] See https://unfccc.int/topics/climate-finance/workstreams/needs-report.

and evaluation systems in place, as mentioned in the 2021 Adaptation Committee technical paper.[9]

39. One participant mentioned the need for clarity and quantifiable obtainable targets by 2030. The approach should make clear what transformations are needed and how to connect the global expectation with outcomes.

40. Another emphasized the time sensitivity of adaptation outcomes, suggesting taking into consideration not just average temperature increase but also timescales in the identification and development of any indicator.

41. Some participants discussed the critical role of attribution in measuring adaptation outcomes, that is, ensuring that adaptation actions have actually been effective, and acknowledged that it is a major area for future research.

4. Quantitative and qualitative approaches and indicators

42. Participants noted that indicators can be either quantitative or qualitative in nature and offer combinations of methodologies where both kinds of indicator are used to develop a more holistic approach to assessing and managing climate risks.

43. Approaches like the IPCC 'burning embers' diagramme could provide a qualitative yet data-backed approach for estimating risk levels and the different levels of adaptation that countries face (see para. 9 above).

44. Another approach discussed was the adaptation-maladaptation continuum, which has central concepts such as benefits to humans, benefits to ecosystems, equity outcomes, transformation potential and reduced greenhouse gas emissions. These could function as criteria or indicators to assess climate adaptation, while also noting the balance between successful adaptation and maladaptation. The IPCC representative highlighted the feasibility and effectiveness framework and the connection of adaptation with the SDGs and related indicators.

45. One participant stated the need for local, national and regional as well as global levels of indicators; the Sendai Framework, for example, has global-level targets, but national governments decide on their own priorities based on their own context and realities. Countries first need to consider their own situations and needs and establish their own priorities and actions, similar to mitigation targets.

46. Key areas where there should be global-level targets include food security, water, biodiversity and health. It was recognized that there are many metrics and indicators in the existing international processes. Examples of indicators discussed included the following:

(a) Agriculture and food production: specific indicators related to the SDGs that cover ecological and socioeconomic drivers of vulnerability (e.g. indicator 15.3.1 "Proportion of land that is degraded over total land area" or 2.3.2 "Average income of small-scale food producers, by gender and indigenous status") and resilience and adaptive capacity (e.g. indicator 2.4.1 "Proportion of agricultural area under productive and sustainable agriculture");

(b) Health: indicators under SDG 3, "Good health and well-being", the narratives under the 'burning embers' scenarios concerning heat-related morbidity and mortality, ozone-related mortality, dengue and other diseases carried by Aedes mosquito, etc., as well as indicator 2.1.1, "Prevalence of undernourishment", incidence of climate-related diseases, incidence of heat- and cold-related illnesses or excess mortality;

(c) Water quality: UNSD indicators, including the proportion of the population using safely managed drinking water services;

(d) Ecosystem services and natural resource assets: Adaptation Fund indicator 5, "Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress";

[9] See https://unfccc.int/sites/default/files/resource/AC_TP_GlobalGoalOnAdaptation.pdf

(e) The Sendai Framework's monitoring approach as having qualitative targets and quantitative indicators (e.g. on substantially enhancing international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the Sendai Framework by 2030), with indicators largely focusing on overseas development assistance and other official flows (e.g. those provided by multilateral agencies, including for technology transfer);

47. The European Environment Agency highlighted the social side of adaptation indicators, for example, potential climate change impacts on schools or hospitals, which could be quantitatively measured despite representing a qualitative issue.

48. Discussions on a multisectoral approach arose, with one participant mentioning their efforts in integrating adaptation into all sectors, which they considered a successful approach but one which would make adaptation difficult to monitor and report on.

49. Participants also discussed vertical integration across levels from the local to the global, including the issues of decision-making at appropriate levels, the linking of national targets to the global goal, and how the adaptation processes at the local level could be reflected upward. One participant suggested applying the World Resources Institute's eight principles of locally led adaptation.[10]

B. Regional, national and local perspectives

50. Participants shared experience in using various indices, metrics and approaches for assessing the state of adaptation and setting goals used at the regional, national and local level. Matters related to support and monitoring and evaluation and indicators at the regional, national and local level were also discussed as a cross-cutting theme.

51. The workshop was informed by a range of expert presentations:

(a) Representatives of the European Environment Agency presented an overview of the Agency's work on adaptation indicators, highlighting its Climate-ADAPT platform and tools used to map climate adaptation;

(b) The Chair of the Least Developed Countries Expert Group (LEG) presented an overview of the collaboration of the LEG with the Adaptation Committee and the Standing Committee on Finance on methodologies for reviewing the adequacy and effectiveness of adaptation and support. The presentation highlighted its framing under current UNFCCC structures, specifically the varying roles of financial mechanisms, Parties, constituted bodies and United Nations organizations, under the decision-making responsibilities of the Conference of the Parties and the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement. The presentation went on to highlight some preliminary criteria used by the LEG;

(c) The Co-Chair of the Adaptation Committee provided an overview of the development and application of monitoring and evaluation systems at the national and subnational level. The presentation highlighted 10 case studies and explained some of the observations, challenges and opportunities that were part of its findings;

(d) A representative of the Adaptation Fund gave a presentation on the Fund's results-based management and strategic results framework, which comprises both quantitative and qualitative indicators, contributing to its overall strategy of accelerating access to effective adaptation finance;

(e) A representative of the Local Climate Adaptive Living Facility (LoCAL) gave a presentation on tools and experiences used by a wide range of countries across regions to support locally led adaptation, including its Assessing Climate Change Adaptation Framework;

[10] See https://www.wri.org/initiatives/locally-led-adaptation/principles-locally-led-adaptation.

(f) A representative of the World Resources Institute gave a presentation on proposed quantitative metrics for tracking finance for locally led adaptation, as well as challenges and opportunities, developed as part of a 2021 working paper;

(g) A representative of the London School of Economics gave a presentation on the usefulness of adaptation indicators, specifying three key lessons that are applicable at the local, national and global level.

52. The indicators mentioned are also included in annex I.

1. Regional perspective

53. The European Environment Agency shared its experience on adaptation approaches and indicators used through the Climate-ADAPT process across the European region. It presented its interactive report on Europe's changing hazards across six sectors, where quantitative indicators of climate data such as temperature rise are mapped across the continent and can be used to assess social vulnerability.

54. In their deliberations, participants discussed indicators and metrics used by countries of a particular region and the issues related to national approaches linking to the regional level. Several participants highlighted common challenges of a region in question, including aggregating information between different levels (local, national, regional), as well as identifying opportunities for sharing best practices across regions and scales.

55. With regard to region-specific data, a participant shared the results of an analysis of the NDCs and NAPs in the African region. This revealed that 417 indicators on adaptation progress have been used for setting and assessing short- and medium-term targets,[11] many of which were aligned with either national visions or international processes, and that 72 per cent of targets in the different NDCs and NAPs involve enhancing adaptive capacity.

56. Participants also discussed some regionally specific experiences of applying monitoring and evaluation systems. In the case of the European Environment Agency's framework in the European Union, a participant elaborated on how monitoring and evaluation features within its Climate-ADAPT cyclical support tool use an applied approach that ensures monitoring and evaluation findings are fed directly into planning future adaptation actions. Results showed that 20 European Union member States have some level of monitoring and evaluation activity, albeit with differing scopes. In the case of the African region, a participant elaborated on challenges in the widespread application of monitoring and evaluation, related to the fact that in the region monitoring and evaluation is mostly applied for project-based activities, and the overall lack of projects on the ground make it difficult to form regional assessments.

57. The representative from the Adaptation Fund provided an overview of the number of projects and levels of funding in different regions. In the presentation[12] they shared the regional distribution of funding as Africa receiving 42 per cent and Asia-Pacific and Latin America and the Caribbean receiving 28 per cent and 26 per cent respectively. Participants raised a number of common support-related regional challenges for accessing finance flows, including lack of capacity to apply for funding among the least developed countries (LDCs) and small island developing States, the accreditation process and the long timescales between assessing needs and the finance flowing to where it is required.

2. National perspective

58. As part of a panel discussion featuring participants from Australia, Brazil, Canada, Egypt, Japan, Maldives, Saudi Arabia and Sweden, panellists shared experience on a variety

[11] See https://agnes-africa.org/wp-content/uploads/2021/10/Policy-brief-12_Indicators_for_tracking_the_Global_-Goal_on_Adaptation_insights_from_50_African_countries_07102021.pdf.

[12] See Adaptation Fund presentation at https://unfccc.int/documents/618487.

of approaches in setting goals, using indicators and metrices at the national level, including the following:[13]

(a) Setting aspirational goals around well-being characteristics, such as a possible indicator on food security. Existing targets and quantitative indicators under the SDG processes were identified in this regard;

(b) Developing national-level indicators, taking into account geographical differences within a country by complementing adaptation strategies implemented by provinces, territories, municipalities and indigenous peoples, and by focusing on sectoral priorities of a given location;

(c) Using outcomes as indicators at the national or subnational and sectoral level;

(d) Developing adaptation actions aligned with NDCs which include mitigation co-benefits, such as planting trees to address desertification, and thus linking adaptation actions to consistency with the Paris Agreement temperature goals;

(e) Sectoral approaches, for example in agriculture, where qualitative indicators can be utilized, such as reducing vulnerability to prolonged droughts and enhancing animal welfare to maximize livestock efficiency;

(f) When developing a NAP, considering the relationship between adaptation actions on the ground and the hierarchical pathway to a national plan, while also noting that adaptation is a journey and the end point is difficult to define, and thus both quantitative and qualitative metrics need to be developed.

59. There was general discussion and further national-level examples were shared. One participant highlighted national approaches being applied in countries across Africa, including goal-setting that involves clear baselines and targets in priority sectors, and quantitative indicators such as hectares of land, access to water resources and irrigation systems. Another intervention shared the experience of applying 10 principles of adaptation,[14] which then inform and shape wider government policies.

3. Local perspective

60. Presentations by representatives of the World Resources Institute and the United Nations Capital Development Fund (UNCDF) LoCAL included experience and characteristics of locally led adaptation, highlighting themes such as governance, hierarchical finance flows and how monitoring and implementation systems can be implemented on the ground. The World Resources Institute proposed quantitative indicators for tracking local adaptation finance, specifically on subsidiarity, flexibility, patience and predictability and cross-cutting areas. UNCDF also shared a quantitative approach, Assessing Climate Change Adaptation Framework (ACCAF),[15] which tracks specific adaptation projects at the local level, but facilitates an aggregation process and sharing best practices.

61. In their subsequent discussions, several participants highlighted the governance processes utilized between the national and local level, ensuring that indigenous peoples' needs are reflected. One participant described how its NAP was designed to stimulate local-level monitoring and evaluation. Another participant revealed the challenge with its country's 290 local municipalities all competing for a portion of a very small pot for adaptation funding. Many participants noted the importance of vertical coordination between governmental bodies, and that there are many examples of effective sequencing of resource mobilization between central and local governmental actors.

62. Common challenges raised by participants regarding local adaptation indicators and metrics include a lack of available data, a need for dedicated institutional structures for

[13] Some countries, when sharing their national experience, also reflected on the topic from their regional circumstances and perspectives.

[14] See https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf (p.23).

[15] See https://www.uncdf.org/article/7738/accaf-a-uncdf-local-framework-for-climate-change-adaptation-monitoring-and-evaluation.

monitoring and evaluation, how to most effectively engage with civil society actors, as well as bottlenecks in finance flows to the local level.

63. In relation to the application of the adaptation indicators at different levels and contexts, the participant from London School of Economics highlighted three important considerations. Firstly, it is key to understand that measurement standards can result in differing results depending on how they are applied. Secondly, that it is important to understand the contexts within which indicators are being applied, as a simple quantitative figure may have differing adaptation implications across regions. And thirdly, it is key that indicators should be linked to decision-making bodies, whether this be at the regional, national or local level.

64. Some participants reiterated that the Glasgow–Sharm el-Sheikh work programme should look towards a just and better future and deliver societal transformation, noting that this would be reflected at all levels. The participants explored the deeper fundamental assumptions about the future, for example, the four-tier approach to the work programme, which could provide a chance for finding common ground for global and national goals and shared ambition as to what constitutes a well-adapted global community. Despite discussions throughout the workshop looking at adaptation indicators at separate levels, it was considered that interlinkages between the local, national, regional and global levels exist and therefore should be considered within the work programme.

C. Cross-cutting issues and linkages

1. Monitoring and evaluation

65. In its presentation, the Adaptation Committee provided an overview of the development and application of monitoring and evaluation systems at the national and subnational level, which will be fully explained in a 2023 technical paper. The draft paper considers M&E as a critical part of the adaptation cycles and highlighted 10 case studies from a diverse range of countries. The presentation highlighted the challenges of data collection and management, and the need for greater capacity, but also that by aligning with existing international commitments and reporting systems, and by establishing monitoring and evaluation systems quickly and then developing them over time, national-level monitoring and evaluation can provide enormous value.

66. In their discussions, participants shared their experience in developing and applying monitoring and evaluation. A presentation from the participant from the London School of Economics noted that there is no one blueprint for NAP monitoring and evaluation, with some countries taking an intention-based approach and others taking an evidence-based approach. One participant explained that most actions under its NAP come from sectors, and are developed by municipalities, and that tracking is done on an annual basis. Another intervention suggested that indicators and targets are linked, and if one changes owing to new knowledge or circumstances, so should the other.

67. In a dedicated breakout group setting, participants further discussed monitoring and evaluation systems, and shared experience and insights. One participant shared its sectoral tracking tool, and another explained how a NAP monitoring and evaluation system was developed. Participants highlighted differences between the initial process of monitoring indicators and the longer timescales at which evaluation takes place and subsequently feeds into future projects. Other points raised in the breakout group included theory of change, monitoring and evaluation fitting national contexts, and how monitoring and evaluation links back to decision-making.

2. Measuring progress on adaptation support and implementation

68. Measuring support and implementation for adaptation was discussed throughout the workshop and at a dedicated breakout group setting.

69. Key issues reiterated by several participants included the inadequacy of current support levels, challenges relating to access to finance and ensuring finance flows to where it is needed.

70. The Chair of the LEG informed participants about joint work with the Adaptation Committee and the Standing Committee on Finance on adaptation support under existing UNFCCC frameworks, and highlighted possible criteria that can be used to measure it. These criteria include assessing institutional governance structures and regulatory frameworks, ease of implementation and accessibility of support for LDCs and small island developing States. The presentation highlighted the ongoing work of the LEG in assisting LDCs to create and meet targets (such as through NAPs), develop monitoring and evaluation tools and increase access to funding mechanisms. The LEG is promoting a systems approach to adaptation action through the formulation and implementation of NAPs and is planning to develop specific indicators for every component of the system. The LEG responded to participants' questions relating to tracking finance, noting that although it does not have a specific process for this, it is reflected in its overall tracking of adaptation actions.

71. One participant noted that finance provisions should not increase national debt levels for developing countries, and that national circumstances and specific needs should be reflected in finance flows. Several participants emphasized the linkages to Article 9, paragraphs 2, 5 and 7,[16] of the Paris Agreement to the discussion on the adequacy of support. One participant underscored the importance of considering research on specific adaptation needs, and how they have been met by adaptation actions implemented thus far. Others noted that adaptation finance is linked to both implementation and governance, and therefore defining where it fits within monitoring and evaluation processes and frameworks can be a complex process.

72. Participants discussed the issues of whether indicators for adaptation finance should inform or characterize the Glasgow–Sharm el-Sheikh work programme. Some participants stressed that adaptation finance is key to countries' abilities to implement actions, and therefore proper indicators and goals, indexes and metrics are critical in this area. Others pointed out that measuring adaptation finance does not show what progress is being made on adaptation, and single indicators do not reflect what is being invested globally.

73. Gaps in data and information availability, particularly in developing countries, was also discussed by participants and acknowledged by the IPCC, which noted knowledge gaps in all the chapters of the contribution of Working Group II to the Sixth Assessment Report of the IPCC. WMO anticipated from the ongoing work on their current report that LDCs and small island developing States face the biggest gaps in data on extreme events while in all probability facing their strongest impacts, and expressed hope that the report will highlight these gaps. This would allow for the strengthening of adaptative capacity and the use of this information as a foundation for accessing finance.

3. Linkages with other processes

74. Throughout the workshop, participants continued elaborating on the overall understanding of the global goal on adaptation, including how to ensure a holistic approach and ambition in setting the goals, and how it links with the global stocktake.

75. On the linkages between the global goal on adaptation and the global stocktake, some participants highlighted that it should be used to measure adequacy of support, and be able to recognize efforts of developing countries. Others noted that because of time pressures for 2023 and that the global goal on adaptation is not yet fully defined, the inputs of the global goal on adaptation into the global stocktake are unlikely to be perfect.

76. Several participants recalled that the global goal on adaptation must be consistent with the temperature goals of the Paris Agreement, with one suggesting that when considering the setting of quality global targets, this could be based on information linked to three different temperature scenarios and projected changed based on mitigation, ambition and commitments to reduce emissions. Others queried whether the global goal on adaptation should focus on specific targets due to the ambiguity of an 'end goal' for adaptation.

77. One participant cited the degree of loss and damage and the time and resources needed for recovery as a possible indicator, which would build on the new collective goal on climate finance in discussions on loss and damage. Another participant, however, stated that loss and

[16] Available at https://unfccc.int/sites/default/files/english_paris_agreement.pdf.

damage should have its own process separate from adaptation as it had a different nature and different specificities from adaptation in terms of, namely in time, space and action, while an adaptation goal was medium to long term; they felt that linking loss and damage with adaptation would slow the latter down and create confusion when it came to implementation and support.

Annex I

Examples of global, regional, national and local indicators

Thematic area	*Targets/Expected outcomes*	*Example indicators*
	Outcome 1: Reduced exposure to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis
		1.1 Number of projects/programmes that conduct and update risk and vulnerability assessments (by sector)
	Output 1.1: Risk and vulnerability assessments conducted and updated	1.2 Number of early warning systems (by scale) and number of beneficiaries covered and scale
	Output 1.2: Targeted population groups covered by adequate risk reduction systems	1.2.1 Percentage of target population covered by adequate risk reduction systems
	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1 Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased
		2.1.1 Number of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)
	Output 2.1: Strengthened capacity of national and subnational centres and networks to respond rapidly to extreme weather events	2.1.2 Number of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)
	Output 2.2: Increased readiness and capacity of national and subnational entities to directly access and programme adaptation finance	2.2.1 Number of targeted institutions benefiting from the direct access and enhanced direct access modality
		3.1 Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses
	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level	3.2 Percentage of targeted population applying appropriate adaptation responses
	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 Number of news outlets in the local press and media that have covered the topic
		3.2.1 Number of technical committees/associations formed to ensure transfer of knowledge
	Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 Number of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders
		4.1 Responsiveness of development sector services to evolving needs from changing and variable climate
	Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.2 Physical infrastructure improved to withstand climate change and variability-induced stress
		4.1.1 Number and type of development sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)
	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.2 Number of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)
	Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress
		5.1 Number of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)
	Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	

Thematic area	*Targets/Expected outcomes*	*Example indicators*
		6.1 Percentage of households and communities having more secure access to livelihood assets
	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.2. Percentage of targeted population with sustained climate-resilient alternative livelihoods
		6.1.1 Number and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies
	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.2.1 Type of income sources for households generated under climate change scenario
	Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7. Climate change priorities are integrated into national development strategy
		7.1 Number of policies introduced or adjusted to address climate change risks (by sector)
	Output 7: Improved integration of climate-resilience strategies into country development plans	7.2 Number of targeted development strategies with incorporated climate change priorities enforced
		15.3.1 Proportion of land that is degraded over total land area
		2.3.2 Average income of small-scale food producers, by gender and indigenous status
		2.4.1 Proportion of agricultural area under productive and sustainable agriculture
		e.g. indicator 15.3.1. Proportion of land that is degraded over total land area,
		2.3.2 Average income of small-scale food producers, by gender and indigenous status), and
Agriculture and food production	Sustainable Development Goals (SDGs) covering ecological and socioeconomic drivers of vulnerability	resilience and adaptive capacity (e.g. 2.4.1 Proportion of agricultural area under productive and sustainable agriculture);
		Narratives under the ‘burning embers’ scenarios regarding heat-related morbidity and mortality, ozone-related mortality, dengue and other diseases carried by Aedes mosquito
Health	Good health and well-being	2.1.1 Prevalence of undernourishment, incidence of cases of climate-related diseases, incidence of heat- and cold-related illnesses or excess mortality
Water quality	Safe drinking water	E.g. UNSD indicator on proportion of population using safely managed drinking water services
Ecosystem services and natural resource assets	Adaptation Fund	5: Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress
		Target F: Substantially enhance international cooperation to developing countries through adequate and sustainable support by 2030
		Indicators largely focusing on overseas development assistance (ODA) and other official flows (e.g. ODA and other official flows provided by multilateral agencies, ODA and other official flows for technology transfer)
	Sendai Framework for Disaster Risk Reduction 2015–2030	
	Target A: Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality in 2020–2030 compared with 2005–2015	
	Target B: Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in 2020–2030 compared with 2005–2015	

Thematic area	*Targets/Expected outcomes*	*Example indicators*
		ODA and other official flows provided by multilateral agencies; ODA and other official flows provided bilaterally; ODA and other official flows for technology transfer; ODA and other official flows for capacity-building; number of programmes and initiatives for the transfer and exchange of STI and capacity-building
	Target F: Substantially enhance international cooperation to developing countries through adequate and sustainable support by 2030	
		Number of countries with risk information and assessment. Number of people per 100,000 that are covered by early warning information
	Target G: Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030	Number of countries with monitoring and forecasting systems; percentage of local governments having a plan to act on early warnings
		Restored and connected habitats can provide corridors for vulnerable species
	SDG 1 No poverty	
		Green buildings, green spaces, clean water, renewable energy, sustainable transport in cities
	SDG 3 Good health and well-being	
		For more than 3.4 billion people in rural areas: improved roads, reliable energy, clean water, food security
	SDG 10 Reduced inequality	
		Policies that increase youth access to land, credit, knowledge and skills can support agrifood employment
	SDG 14/15 Life below water/life on land	
		Early warning systems integrate hazard information with risk analysis to provide meaningful early warnings that enable action to minimize impacts
	Secretary-General's five year goal of early warning systems for all	
		More than 100,000 premature deaths; fires cost approximately USD 16 billion, 1.9% of gross domestic product
	SDG 1 No poverty	
		Losses of approximately USD 800 million/year for following three years of estate crops (palm oil, rubber and coconut)
	SDG 2 Zero hunger	
		More than 500,000 people sought medical attention for respiratory illness
	SDG 3 Good health and well-being	
		Approximately 4.7 million children stayed home from school
	SDG 4 Quality education	
	SDG 15 Life on land	2.6 million ha land burned; smoke affected biodiversity
		748 ± 209 Mt CO2 estimated to have been released, peatlands accounted for one third of area burned
	SDG 13 Climate action	
		Change in water-use efficiency over time
Availability and quality of water	SDG 6.4.1, 6.4.2	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
Availability and quality of productive lands	SDG 15.3.1	Proportion of land that is degraded over total land area
		Proportion of fish stocks within biologically sustainable levels
Status of ecosystems supporting		Forest area as a proportion of total land area
agriculture production	SDG 14.4.1, SDG 15.1.1, SDG 15.4.2	Mountain Green Cover Index
		Percentage of people with ownership of secure rights over agricultural land (by sex) Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control
Access to land	SDG 5.a.1, SDG 5.a.2	
		Volume of production per labour unit by classes of farming/pastoral/forestry enterprise type
Income and livelihoods	SDG 2.3.1, SDG 2.3.2	Average income of small-scale food producers, by sex and indigenous status
Sustainable and resilient Ecosystems	SDG 15.2.1, SDG 14.7.1, SDG 14.6.1, SDG 14.b.1	Sustainable forest management, sustainable fisheries as a percentage of gross domestic product on small island developing States, least developed countries and all

Thematic area	*Targets/Expected outcomes*	*Example indicators*
		countries, degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing, policy/institutional framework which recognizes and protects access rights for small-scale fisheries
		Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities (tier 1)
Status of diversity of genetic resources	SDG 2.5.1, SDG 2.5.2	Proportion of local breeds classified as being at risk, not at risk or at unknown level of risk of extinction
		Number of countries that adopt and implement national disaster risk reduction strategies in line with the UNDRR
		Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies
Integration of climate change measures into national policies, strategies and planning	SDG 13.1.2, SDG 13.1.3, SDG 13.2.1	Number of countries with NDCs, long-term strategies, NAPs and adaptation communications, as reported to the secretariat
Agricultural investment	SDG 2.a.1	The agriculture orientation index for government expenditures
		Prevalence of undernourishment (tier 1)
Food security and nutrition status	SDG 2.1.1, SDG 2.1.2	Percentage of moderate/severe food insecurity in the population
Impacts on agricultural systems	UNDRR C-2	Direct agricultural loss attributed to disasters
		Direct economic loss attributed to disasters in relation to global gross domestic product
		Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
Impact on people and society	SDG 1.5.2, SDG 13.1.1	
Vulnerability	Income of small-scale food producers (SDG 2.3.2)	Minimum wage for agricultural and non-agricultural activities
		Budget allocation according to the Global Strategic Framework for Food Security and Nutrition
	Public investment in agriculture (SDG 2.a.1)	Public investment in areas with high and very high rates of the Index of Vulnerability & Nutritional Food Insecurity
		Proportion of the forest area in the total extension of the country (%)
	Forest area (SDG 15.1.1)	Forest cover (ha) by forest type
	Progress towards sustainable forest management (SDG 15.2.1)	Annual deforestation rate, national and departmental Forest fires: type of fire and area affected (ha); forest fires by forest type and affected area (ha)
	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (SDG 15.1.2)	Protected areas: quantity and extension (ha) by management category
Risks and threats		Prevalence of food and nutrition insecurity (in households)
		Proportion of children <five years who are underweight for age
		Global malnutrition
Food security and nutrition	Severity of food insecurity (SDG 2.1.2)	Proportion of children <five years with chronic malnutrition
	Prevalence of undernourishment (SDG 2.1.1)	
	Proportion of agricultural area under productive and sustainable agriculture (SDG 2.4.1)	
Adaptation practices	Number of deaths and directly affected persons attributed to disasters (SDG 13.1.1)	Ha under improved agricultural productive systems
Resilience	Secretary-General's early warning systems goal	A target of 50 per cent of vulnerable populations made resilient by 2030, going up to 100 per cent by 2050, as

Thematic area	*Targets/Expected outcomes*	*Example indicators*
		well as the expansion of coverage of early warning systems
	A target for adaptive capacity	Using resilience attributes as a way to measure adaptive capacity
		Measuring adaptation finance as an indicator or set of indicators
	Global Set and metadata	Adaptation and vulnerability indicators contained in the Global Set
Food security	SDG 2.C.1	Measuring an increase in the number of functioning storage facilities
	SDG 1.5.4	Measuring an increase in the proportion of local governments that adopt and implement local disaster risk reduction strategies
		Ratio of percentage area at flood risk between administrative units in Q5 (top 20%) and Q1 (bottom 20%) of unemployment rate
	Exposure of vulnerable group to risk flooding	Ratio of percentage area at flood risk between administrative units in Q5 (top 20%) and Q1 (bottom 20%) of proportion of people over 65
Water and irrigation	Infrastructure in mountain ecosystem requires regular maintenance and renovation to maximize its use. Renovation includes 'climate proofing' of irrigation schemes so that the scheme remains functional	Number of local infrastructures made more resilient to climate change
Water and irrigation	Farm road improvement includes installation of waste pipes to drain out storm water and using gravel in farm roads to make it pliable, particularly during monsoons	Number of local infrastructures made more resilient to climate change
Water and irrigation	Climate change impacted or dried up many water sources in the communities. Further, conventional water supply schemes which are supplied through open drainage are inefficient, resulting in loss and contamination. Pressurized piped water supply is being promoted in mountain areas	Number of local infrastructures made more resilient to climate change
Water and irrigation	Absence of proper drainage results in soil erosion, often causing flooding. Hence, the construction of storm water drainage ensures a regulated flow of storm water without causing any damage to the environment	Number of local infrastructures made more resilient to climate change
	Landfill management has more mitigation than adaptation benefits. Nonetheless, proper maintenance of landfill helps minimize pollution of water sources, thus ensuring availability of fresh water for both drinking and irrigation	Number of local infrastructures made more resilient to climate change
	Subsidiarity	Degree of meaningful involvement of local actors in decision-making related to financial transactions
	Subsidiarity	Ability of local actors to make decisions about finance for adaptation
	Flexibility	Level of external restrictions imposed on use of funds
	Flexibility	Ability of local actors to adjust to unforeseen changes
	Patience and predictability	Duration of funding
	Patience and predictability	Patience in achieving desired outcomes
	Patience and predictability	Predictability
	Cross-cutting	Tracking how much finance for adaptation flows to subnational levels

Thematic area	*Targets/Expected outcomes*	*Example indicators*
	Monitoring and evaluation	Number of countries with monitoring and evaluation systems
		Whether there is a national climate change risk assessment available
		Whether there is a monitoring and evaluation system in place
		Whether there is an adaptation plan in place
	A target for adaptive capacity	Using resilience attributes as a way to measure adaptive capacity

Annex II

Further reading recommended and shared by participants

European Environment Agency. Urban adaptation and social inequalities: https://www.eea.europa.eu/publications/urban-adaptation-in-europe; https://www.eea.europa.eu/publications/urban-adaptation-to-climate-change; https://www.eea.europa.eu/publications/just-resilience-leaving-no-one-behind.

International Institute for Environment and Development. Integrating climate risks into sustainable development evaluation: https://www.iied.org/21026iied.

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World Meteorological Organization. Global status of early warning systems: https://www.undrr.org/publication/global-status-multi-hazard-early-warning-systems-target-g.

World Health Organization. Overall progress that governments have made in the field of health and climate change to date. *2021 WHO Health and Climate Change Global Survey Report*; available at https://www.who.int/publications/i/item/9789240038509.

World Resources Institute. Locally led adaptation: https://www.wri.org/initiatives/locally-led-adaptation/principles-locally-led-adaptation.