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Items for discussion and decision

Climate change statistics

Report of the Secretary-General

Summary

The present report was prepared in accordance with Economic and Social Council decision 2021/224 and past practices by the Statistics Division of the Department of Economic and Social Affairs of the Secretariat, in collaboration with the secretariat of the United Nations Framework Convention on Climate Change. The report contains an update on the work of the Division with regard to climate change statistics, in particular the development of a global set of climate change statistics and indicators, which was mandated by the Statistical Commission at its forty-seventh and forty-ninth sessions. The report contains the final draft of the global set of climate change statistics and indicators, which provides a comprehensive statistical framework with statistics, indicators and metadata designed to support countries in preparing their own sets of climate change statistics and indicators according to their individual concerns, priorities and resources. It also serves to explain the process of developing the global set, which involved an extensive global consultation. The results of the consultation were discussed at the eighth meeting of the Expert Group on Environment Statistics, at which it was recommended that the global set be submitted to the Statistical Commission at its fifty-third session for adoption. The report also includes a workplan prepared by the Division outlining the way forward towards the implementation of the global set.

The Commission is invited to consider and adopt the global set as the framework for climate change statistics and indicators and encourage its implementation in countries, and to provide its views on the workplan outlining the way forward.

* E/CN.3/2022/1.



I. Introduction

1. At its forty-ninth session, held from 6 to 9 March 2018, the Statistical Commission adopted decision 49/113 (see [E/2018/24-E/CN.3/2018/37](#)), in which it:

(a) Welcomed the report of the Secretary-General, prepared by the Statistics Division of the Department of Economic and Social Affairs of the Secretariat, in collaboration with the Economic Commission for Europe (ECE) and for the first time also with the secretariat of the United Nations Framework Convention on Climate Change to promote the policy and statistics interface;

(b) Expressed its support for the work of the Statistics Division in the development of a global set of climate change statistics and indicators, building upon all other processes in an effective and appropriate manner;

(c) Endorsed the list of activities prepared by the Statistics Division for the development of the global set of climate change statistics and indicators that would be included in the workplan to be presented to the Statistical Commission at a future session;

(d) Supported the expansion of the mandate of the Expert Group on Environment Statistics to cover more aspects of climate change statistics and indicators and to contribute to the development of the above-mentioned workplan;

(e) Urged countries to participate in the pilot survey on climate change-related statistics and indicators then being undertaken by the Statistics Division, as well as in the planned global consultation on climate change statistics and indicators;

(f) Reiterated the importance of enhancing collaboration between national statistical offices and national authorities responsible for reporting climate change-related information to the secretariat of the United Nations Framework Convention on Climate Change and investing in the development of climate change statistics, in particular the underlying environment, energy, agricultural and industrial statistics, given the expected increased and possibly more diverse data requirements for the implementation of the Paris Agreement;

(g) Requested the Statistics Division and the secretariat of the Framework Convention to strengthen the link between statistics and policy, for example, by undertaking joint initiatives in the development of climate change statistics and indicators, encouraging joint capacity-building efforts and training with other partners and exploring ways to encourage national statistical offices to be more involved in the preparation of data submissions to the secretariat of the United Nations Framework Convention on Climate Change, in support of the implementation of the Paris Agreement;

(h) Expressed its support for the work being undertaken by the task force of ECE on the core set of climate change-related indicators, and encouraged countries to pilot the initial set of key indicators developed by the task force and to prepare national road maps for the development of climate change-related statistics;

(i) Welcomed the harmonized and coordinated efforts being undertaken by the Statistics Division and ECE in terms of methodological work and the development of indicators, and encouraged the continuation of those efforts;

(j) Noted the use of the System of Environmental-Economic Accounting for deriving the set of climate change-related statistics of the Economic Commission for Europe so as to allow for linkages with the economy to support analytical work, and encouraged further consideration of the System, in particular in the context of the development of air emission accounts;

(k) Welcomed a greater focus on disaster-related statistics given the importance of the Sendai Framework for Disaster Risk Reduction 2015–2030,¹ and decided to include in the agenda of its fiftieth session a separate item on that topic, building on existing work in the Economic and Social Commission for Asia and the Pacific, ECE and the United Nations Office for Disaster Risk Reduction.

II. Background

2. Following the adoption by the Statistical Commission of decisions 47/112 (see [E/2016/24-E/CN.3/2016/34](#)) and 49/113, the Statistics Division developed the global set of climate change statistics and indicators, in collaboration with the secretariat of the United Nations Framework Convention on Climate Change, to promote the policy and statistics interface. The Statistics Division initiated the process of developing the global set based on a systematic review of country-based practices and the close link between global climate change negotiations and reporting and national statistics.

3. It should be noted that, given the request from the Statistical Commission in 2018 for the Statistics Division and the secretariat of the United Nations Framework Convention on Climate Change to strengthen the link between statistics and policy, the relevant articles of the Paris Agreement and subsequent decisions of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement are mentioned, as appropriate, for most of the indicators in the global set of climate change statistics and indicators, thereby clearly demonstrating this linkage. The Expert Group on Environment Statistics² has been contributing to the work on the global set through the review of iterative versions and discussions at Expert Group meetings.

4. The report of the Secretary-General to the Statistical Commission at its fifty-second session ([E/CN.3/2021/20](#)) provided an overview of the work being carried out in the field of climate change statistics and indicators by the Statistics Division, the secretariat of the United Nations Framework Convention on Climate Change and ECE since 2018, including the most recent activities in the development of methodology, coordination, capacity development, dissemination and related activities, such as the pilot survey on the draft global set of climate change statistics and indicators undertaken in 2020. Several other international, regional and national institutions have been embarking on important work in climate change statistics as described in section F in that report. Based on the growing need to share and coordinate such information, the Statistics Division compiled an inventory of related work on climate change statistics being carried out by partner organizations as part of its global consultation on the draft global set in 2021, of which details on the various activities are described in the background document entitled “Global consultation on the global set”.

5. The present report contains an overview of developments since December 2020, as well as the structure and contents of the global set of climate change statistics and indicators. Results of the global consultation, contributions of the Expert Group on Environment Statistics and bilateral consultations with specialized agencies are described. The final part sets out the steps to be undertaken to support the implementation of the global set. This requires an enhancement of the roles of national statistical offices so that they can coordinate the development of national sets of climate change statistics and indicators and the strengthening of data collection, in particular in the area of environment statistics, which is closely related to climate change statistics, as described in decision 47/112 (subparas. (b) and (d)) of the Statistical Commission.

¹ General Assembly resolution 69/283, annex II.

² See https://unstats.un.org/unsd/envstats/fdes/fdes_eges.cshtml.

III. Recent developments with regard to the global set of climate change statistics and indicators, including the global consultation

6. Based on the review and recommendations from the seventh meeting of the Expert Group on Environment Statistics,³ the Statistics Division, in continuous collaboration with the secretariat of the United Nations Framework Convention on Climate Change, undertook further methodological development, in particular to address the areas of vulnerability and adaptation. These areas were confirmed as especially important for small island developing States and developing and least developed countries, and were also identified as the most challenging areas when it came to advancing the production of internationally comparable statistics and indicators. The areas of drivers and mitigation are of more importance to developed countries and contain statistically better-defined indicators. The experts also recognized the importance of applying the relevant Sustainable Development Goal indicators in the global set of climate change statistics and indicators, even if some indicators needed further work to relate them to climate change. Missing, weak or insufficiently defined statistics and indicators were identified in all areas. Several new indicators were proposed to be included in the global set, primarily in the areas of work of the Food and Agriculture Organization of the United Nations (FAO).

7. Most of these outstanding issues were addressed via bilateral consultations with specialized agencies and further work with experts and consultants. For the indicators that were identified as lying outside the scope of official statistics during the pilot survey of 2020, the Statistics Division consulted, inter alia, the following specialized international agencies: World Meteorological Organization (WMO), World Health Organization, United Nations Office for Disaster Risk Reduction and the secretariat of the Convention on Biological Diversity. In addition, some novel indicators were better formulated via consultations with the Organisation for Economic Co-operation and Development (OECD). The consultations helped to better define the indicators and statistics in their areas of expertise and also to define the relevant methodological guidance. In addition, two international consultants helped to further explore which vulnerability and adaptation indicators were the most needed in small island developing States and African countries. As a result, several new suggestions were included, and further methodological research was done accordingly.

8. Based on the above work, in early 2021, the Statistics Division, in collaboration with the secretariat of the United Nations Framework Convention on Climate Change and other international bodies, as well as the Expert Group on Environment Statistics, prepared a draft of the global set of climate change statistics and indicators for a global consultation.⁴ The objectives of the consultation were: (a) to define a global set from proposed indicators based on relevance to countries; (b) to consolidate available methodology for climate change statistics and indicators; (c) to define improvement needs and gaps in methodology; and (d) to assess existing capacities to compile climate change statistics and indicators. The consultation was organized in two parts, tailored to collect the information needed from countries and international and regional agencies. For countries, part one of the consultation involved enquiries about the institutional dimensions of their preparedness to produce climate change statistics and indicators; for agencies, it involved enquiries about their activities related to data collection, methodology development and capacity development in the area of climate change statistics. Part two contained the draft global set and asked respondents to provide comments on each individual indicator or statistic and on the

³ See https://unstats.un.org/unsd/envstats/fdes/fdes_eges7.cshtml.

⁴ See https://unstats.un.org/unsd/envstats/ClimateChange_globalconsultation.cshtml.

metadata. For this part, countries were requested to assess the relevance, methodological soundness and data availability for each indicator, and agencies were asked to assess the indicators and the metadata in their respective areas of expertise.

9. The draft global set of climate change statistics and indicators, accompanied by short metadata for the 134 indicators and 195 underlying statistics, was distributed for a global consultation to all countries and relevant international and regional agencies between May and September 2021. In order to facilitate smooth communications between countries and the Statistics Division for the purpose of this global consultation, the Statistics Division offered optional information sessions. Six information sessions were held in English, Spanish and French. In addition, the Division provided bilateral assistance and further clarifications to several countries that expressed their needs. Several of the United Nations regional commissions assisted the Statistics Division in the process and also provided assistance with outreach and further information on the global consultation to the countries in their respective regions.

10. Responses and feedback were received from 86 States and areas and 26 agencies (see annex I). Detailed summaries and geographical analysis are presented in the background document entitled “Global consultation on the global set”.

11. The Statistics Division reviewed each response and provided feedback to the countries on both parts of the consultation, as a result of which about 40 countries improved their assessments and submitted revised responses to the consultation. It should be noted that about 14 countries acknowledged receipt of the consultation materials; some of them also communicated information on related national activities but could not complete the consultation in time.

12. The global consultation affirmed that countries were actively engaging in the area of climate change statistics, including by developing their own national sets. The Statistics Division promotes such activities, in which national statistical offices are prepared to initiate the collection and compilation of data and the dissemination of climate change statistics in a way complementary to the ongoing reporting to the secretariat of the United Nations Framework Convention on Climate Change, as recommended by the Statistical Commission at its forty-ninth session, in 2018. National statistical offices face challenges in conducting national consultations and setting up processes for the collection and exchange of data due to the very broad scope of topics which directly or indirectly are linked to climate change and involve multidisciplinary expertise, as well as the ongoing coronavirus disease (COVID-19) pandemic. Despite the difficulties national statistical offices may face in attempting to address a vast array of topics, the global consultation has proved to be useful, as it encouraged national statistical offices to coordinate and collect national responses from all the relevant specialized departments and agencies within the country and, in some cases, to develop or enhance national frameworks on climate change statistics.

13. The country responses to part I demonstrate that many national statistical offices have strong collaboration with the national focal points for the United Nations Framework Convention on Climate Change and participate in technical committees on climate-related issues, whereas, in some other countries, such practices need to be further encouraged or developed. In addition, national statistical offices are increasingly involved in the preparation of their country’s greenhouse gas inventory, as part of the reporting obligations under the Convention, which is expected to increase considering the requirements under the Paris Agreement. A considerable number of climate change-related statistical strategies and data outputs have been produced by national statistical offices, which cover a great breadth and depth of the diverse topics and thematic areas of climate change. There has been a slow increase in the number of climate change surveys or the inclusion of related modules in

existing surveys and censuses, as well as the production of reports on climate change statistics. With regard to capacity development needs, countries cited, among other things, the need for the development of specialized surveys, the collection of climate change-related data, the development of metadata and indicators, statistics for climate change adaptation and mitigation processes, support tools in national and/or indigenous languages, and community engagement and platforms.

14. The responses on part I from international and regional agencies revealed various methodological and capacity development activities. Fifteen agencies indicated that they collected climate change-related data directly from countries. The main challenges expressed regarding data collection were, inter alia, promoting the use of climate-related data to policymakers, data availability at the country level, data access and confidentiality, comparability across countries, the use of multiple sources leading to duplication and inconsistencies, and different definitions across sources. On methodological development, 17 agencies indicated that they produced or maintained a list of indicators or statistics that pertained to climate change (such as the Conference of European Statisticians set of core climate change-related indicators⁵) or related topics in the global set of climate change statistics and indicators, while 13 agencies indicated that they had developed methodological guidelines for climate change statistics or indicators.

15. Part II of the global consultation affirmed that most indicators and statistics were suitable for inclusion in the global set of climate change statistics and indicators, demonstrating its overall robustness. Detailed analysis of the results is presented in the background document entitled “Global consultation on the global set”. In addition, countries and agencies provided comments on the existing indicators and the metadata, as well as proposed some new indicators. The new indicators were screened according to the following criteria: (a) link to one of the five climate change areas; (b) suitability for national policymaking and monitoring purposes; (c) fit into the area and topics structure in a balanced manner; and (d) possibility for development into the indicator-statistic-metadata structure. Detailed methodological reviews and additional metadata inputs were provided by FAO, the United Nations Environment Programme (UNEP) World Conservation Monitoring Centre, the European Environment Agency and ECE, while more specialized advice was provided by the International Monetary Fund (IMF), the World Bank, OECD, the International Energy Agency, the International Organization for Migration, the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women) and the secretariat of the United Nations Framework Convention on Climate Change, as well as from within the Statistics Division. The complementarity between the global set of climate change statistics and indicators and the Conference of European Statisticians set of core climate change-related indicators was further discussed and improved in the context of the global consultation. Based on the feedback, the Statistics Division prepared several points on which further advice was needed by the Expert Group on Environment Statistics and specialized agencies, including the suggestions for new indicators.

16. The responses and feedback from the global consultation were summarized and presented to the Expert Group on Environment Statistics⁶ at its eighth meeting, in October 2021, for review and discussion. Group work sessions were organized in which the Statistics Division outlined the following key issues that the Expert Group was expected to review (in addition to other issues of a more specialized nature, which the Division is further addressing bilaterally with specialized agencies): suggestions for including new indicators in the global set of climate change statistics and

⁵ See <https://unece.org/statistics/publications/CES-set-of-core-climate-change-related-indicators>; more recent developments regarding the work of ECE on climate change-related statistics can be found in <E/CN.3/2022/7>.

⁶ See https://unstats.un.org/unsd/envstats/fdes/fdes_eges8.cshtml.

indicators; suggestions for modifying some of the existing statistics and indicators; and some examples of tier 3 indicators that require the development of new methods. As a result of these sessions, 13 new indicators were approved for inclusion in the global set, and 7 indicators and statistics were modified. Based on the feedback from the global consultation, the review by the Expert Group and bilateral consultations, several indicators and statistics were consequently improved or added in several thematic areas, including the consideration of gender (the role of women), the impact of disasters and their costs, biodiversity, energy and greenhouse gas emissions.

17. Considering the extensive global consultation, as well the country presentations, plenary discussions and group work during the meeting, the Expert Group recommended that the global set of climate change statistics and indicators be submitted to the Statistical Commission at its fifty-third session, in 2022, for adoption. Continuous improvement of the adopted global set will be undertaken, in particular of the tier 3 indicators and the metadata. A revised global set, based on methodological developments and the experience gained from implementation in countries, will be submitted to the Statistical Commission in three to five years for consideration.

18. Most recently, parties to the Paris Agreement adopted guidance for operationalizing the modalities, procedures and guidelines for the enhanced transparency framework for action and support referred to in article 13 of the Paris Agreement at the twenty-sixth session of the Conference of Parties to the United Nations Framework Convention on Climate Change, held in Glasgow, United Kingdom of Great Britain and Northern Ireland.⁷ This guidance has an impact on the reporting and review of information under the Paris Agreement and finalizes the last necessary operational guidance to enable parties to prepare for submission of the first biennial transparency reports, including the associated tools to facilitate the electronic reporting of the common reporting tables for the reporting of greenhouse gas inventories and common tabular formats for reporting information to track progress and information on financial, technology transfer and capacity-building support. Consequently, there is an increasing role for the national statistical offices in providing high quality and timely data, ensuring the trustworthiness of the overall information submitted.

IV. Overview of the global set of climate change statistics and indicators

19. The global set of climate change statistics and indicators is a comprehensive statistical framework, with statistics, indicators and metadata, designed to support countries in preparing their own sets of climate change statistics and indicators according to their individual concerns, priorities and resources. It will assist countries embarking on the development of climate change statistics programmes by providing the scope and coverage as to what may be considered relevant to climate change. It can also assist countries already involved in this area of statistics by providing a reference list. To provide flexibility, the indicators are formulated in the simplest possible way, so that they can be easily applied or adapted to national circumstances. In addition, a tiering system was set up in a way that distinguishes the most commonly applied indicators from those that are less applied (at present) and those that require substantial methodological development to become applicable.

20. The global set of climate change statistics and indicators takes into consideration the diversity of all States Members of the United Nations at varying stages of development and with different geographical characteristics. To make sure that the countries with least developed and developing statistical systems are not left behind,

⁷ See https://unfccc.int/sites/default/files/resource/cma2021_L21E.pdf.

the global set includes both the indicators addressing climate change and the underlying statistics needed for their compilation, whenever distinct guidance for these statistics was identified.

21. The global set of climate change statistics and indicators will support the implementation of the enhanced transparency framework and the global stocktake of the Paris Agreement, as well as climate-related Sustainable Development Goal indicators. It will facilitate harmonization and cross-fertilization across all levels by promoting complementarity with other regional (in particular the Conference of European Statisticians set of core climate-change related indicators), national or specialized (e.g. related to disasters, energy and biodiversity) sets of climate change indicators.

A. Scope and structure of the global set of climate change statistics and indicators

22. The scope of the global set of climate change statistics and indicators covers the climate change aspects defined by the five policy areas of the Intergovernmental Panel on Climate Change, namely drivers, impacts, vulnerability, mitigation and adaptation. Its structure is based on those five areas and the Framework for the Development of Environment Statistics. The global set includes primarily the biophysical indicators and statistics, but also human activities, and social and institutional aspects related to climate change. The links between policy and statistics are articulated according to the relevant articles of the Paris Agreement and the subsequent decisions of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement, as well as related Sustainable Development Goal and Sendai Framework indicators.

23. Even though internationally agreed frameworks and methodologies, including the Sustainable Development Goals, the Sendai Framework and the Framework for the Development of Environment Statistics, contain many of the needed climate change indicators and statistics, additional ones were sourced from published methodologies of WMO, FAO, UNEP and the secretariat of the Convention on Biological Diversity, among others. In this way, the global set of climate change statistics and indicators organizes the most relevant indicators and statistics in a harmonized and consistent structure, with short metadata for each indicator. Since some of these methodologies are the subject of ongoing development, a continuous improvement of the global set will be undertaken, in particular for the tier 3 indicators and the metadata. Further methodological development is needed, in particular in the areas of vulnerability and adaptation, in which national statistical offices have strong foundations to contribute, including via existing tools such as censuses and surveys.

24. The five policy areas of the Intergovernmental Panel on Climate Change are broken down into 34 topics. In each area are listed the most important indicators to describe the topics, thus providing guidance to countries developing national climate change statistics programmes in a comprehensive and balanced manner. For those indicators for which statistics with distinct methodology were identified, the statistics were included, too. In this way, the global set of climate change statistics and indicators contains 158 indicators and their underlying statistics.⁸ For a complete list of the indicators contained in the global set, see annex II of the present document. The global set, including the indicators and statistics, the tiering and the metadata, will be submitted to the Commission as a background report entitled “Global set and metadata”.

⁸ The definitions of the areas and the list of topics can be consulted at https://unstats.un.org/unsd/envstats/ClimateChange_areas_topics.cshhtml.

25. The tiers were determined considering relevance, methodological soundness and data availability. The relevance or connection to climate change varies by indicator; however, a certain relation to climate change has been identified for all the indicators included in the global set of climate change statistics and indicators:

- Tier 1 indicators are relevant, methodologically sound and based on the global consultation responses for which at least 50 per cent of the countries have affirmed data availability⁹
- Tier 2 indicators are relevant and methodologically sound, but with less than 50 per cent of the countries having affirmed data availability¹⁰
- Tier 3 indicators are relevant but not methodologically sound, meaning that even if country data may be available, no internationally agreed methodologies were identified.

26. The global set of climate change statistics and indicators is accompanied by short metadata for each indicator. The metadata contain the following fields which describe that indicator or statistic: belonging to a predefined set of themes, topics and one of the Intergovernmental Panel on Climate Change areas; references to the relevant indicators or statistics of the Paris Agreement articles and subsequent decisions of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement, the Framework for the Development of Environment Statistics, the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015–2030,¹¹ as appropriate; and a short definition and explanation of relevance to climate change policy. Further metadata details provide suggestions of national data sources, data collection methods, update frequency, category of measurement and potential aggregations and scales. References to available international data collections and the applicable methodological guidance are also provided. Metadata were completed to the extent possible for all the proposed indicators and statistics, ensuring that definitions are applied for the indicators and statistics assessed as tiers 1 and 2. The relevance is explained for all indicators. There are gaps in the metadata, especially for the indicators assessed as tier 3.

B. Global set of climate change statistics and indicators and its relation to other frameworks

27. The main statistical references included in the metadata of the global set of climate change statistics and indicators include the internationally accepted frameworks, standards and guidelines, e.g. the Intergovernmental Panel on Climate Change 2006 guidelines,¹² the Framework for the Development of Environment Statistics and its manual on the basic set of environment statistics,¹³ Sustainable Development Goal indicators metadata,¹⁴ the Sendai Framework, the Conference of European Statisticians set of core climate change-related indicators metadata,¹⁵ the International Recommendations for Energy Statistics,¹⁶ the System of Environmental-Economic Accounting Central Framework¹⁷ and the System of Environmental-Economic

⁹ This rule was not applied for the Sustainable Development Goal indicators, for which the original tiers are retained.

¹⁰ The Statistics Division could not identify country data in the international collections.

¹¹ See www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030.

¹² See www.ipcc-nggip.iges.or.jp/public/2006gl.

¹³ See https://unstats.un.org/unsd/envstats/fdes/manual_bses.cshtml.

¹⁴ See <https://unstats.un.org/sdgs/metadata>.

¹⁵ See <https://statswiki.unece.org/pages/viewpage.action?pageId=285216611>.

¹⁶ See <https://unstats.un.org/unsd/energy/metadata/documents/IRES-web.pdf>.

¹⁷ See <https://sea.un.org/content/sea-central-framework>.

Accounting–Ecosystem Accounting.¹⁸ The global set adds value to these existing methodological frameworks and indicator sets by explaining their climate relevance and contribution towards the streamlining of their application for climate change policy. Further work is required to enhance the relevance of some indicators to climate change, e.g. by narrowing down their definition or by introducing appropriate disaggregation elements to strengthen their ability to inform discussions on climate change.

28. Additional thematic areas of statistical relevance are also included in the global set of climate change statistics and indicators and its metadata, namely those related to meteorology, hydrology, environmental quality, human health and biodiversity, among others, which are not routinely addressed by national statistical offices at present. In these areas, further engagement with specialized agencies and academic institutions will be required to gradually advance towards their application in official statistics.

29. Not least, the global set of climate change statistics and indicators also includes indicators and statistics that are the subject of the latest statistical advances, including from the monitoring framework of the secretariat of the Convention on Biological Diversity for the post-2020 global biodiversity framework,¹⁹ the climate change indicators dashboard²⁰ of IMF and the International Programme for Action on Climate²¹ of OECD, and therefore may not be widely applied by countries at present. However, given the very dynamic and urgent nature of climate-related data requirements, these were defined as being of the highest relevance and included in the global set.

30. It should be noted that the global set of climate change statistics and indicators and the Conference of European Statisticians set of core climate change-related indicators are complementary. The global set is tailored for all countries while the Conference of European Statisticians set, based on the System of Environmental-Economic Accounting to the extent possible, is highly relevant for the member countries of the Conference of European Statisticians. It should be noted that the global set also contains indicators that can be derived from the System that are not included in the Conference of European Statisticians set. It is also recommended to promote complementarity among the global set and other regional and national sets of climate indicators to encourage harmonization across all levels.

V. Putting the global set of climate change statistics and indicators to work

31. In order to globalize climate change statistics and indicators, the Statistics Division and the secretariat of the United Nations Framework Convention on Climate Change continued to work closely to finalize the global set of climate change indicators and statistics, which is designed to support countries in preparing their own sets of climate change statistics and indicators, according to their individual concerns, priorities and resources, which will also contribute to the implementation of the enhanced transparency framework of the Paris Agreement. Moreover, the secretariat of the United Nations Framework Convention on Climate Change, together with the Statistics Division, continued to promote cooperation between national statistical offices and national authorities responsible for climate change and to strengthen the link between statistics and policy at the national and international levels.

¹⁸ See <https://seea.un.org/ecosystem-accounting>.

¹⁹ See <https://www.cbd.int/nbsap/monitoring.shtml>.

²⁰ See <https://climatedata.imf.org>.

²¹ See <https://www.oecd.org/climate-action/ipac>.

32. Considering the mandates received from the Statistical Commission at its forty-ninth session, the Statistics Division and the secretariat of the United Nations Framework Convention on Climate Change prepared joint reports on climate change statistics to the Statistical Commission, participated actively and supported each other in organizing events such as the regional and national workshops, webinars, stakeholder dialogues, side events and other meetings. Furthermore, they continued to actively cooperate during the meetings of the Expert Group on Environment Statistics.

33. The Statistics Division and the secretariat of the United Nations Framework Convention on Climate Change have defined three main priorities of further work: (a) to encourage the implementation of the global set of climate change statistics and indicators in countries; (b) to further develop the methodology and contribute towards enhanced complementarity between global, regional and national initiatives; and (c) to enhance the coordination of capacity development and resource mobilization. These priorities are reflected in the action points listed below, which will be expanded into a workplan to be discussed at the next meeting of the Expert Group on Environment Statistics and consequently presented to the Statistical Commission.

34. These priorities require the Statistics Division, in collaboration with the secretariat of the United Nations Framework Convention on Climate Change and other relevant bodies, based on availability of resources, to undertake the joint initiatives set out below.

Capacity development activities

35. The Statistics Division, in collaboration with the secretariat of the United Nations Framework Convention on Climate Change and other relevant bodies, would carry out capacity development activities with support from regional and other development partners by:

(a) Offering continuous (remote, online) support to countries in their efforts to set up national processes;

(b) Organizing regional workshops based on the findings of the global consultation, which highlighted pronounced geographical gaps;

(c) Leading advisory missions in countries based on raised demands and requests for support.

Development of the methodology for climate change statistics and indicators

36. The Statistics Division, in collaboration with the secretariat of the United Nations Framework Convention on Climate Change and other relevant bodies, would further develop the methodology for climate change statistics and indicators by:

(a) Reviewing and updating the tier 3 indicators and completing their metadata. The global consultation provided information on many tier 3 indicators for which national methods exist in at least several countries. Consultations will be organized to advance towards internationally agreed methods;

(b) Following up ongoing statistical processes to ensure that latest guidance is reflected for the indicators at all tiers. These include the latest reports of the Intergovernmental Panel on Climate Change and advances in methodological guidance, as well as further work by the post-2020 global biodiversity framework of the secretariat of the Convention on Biological Diversity, ECE, the International Programme for Action on Climate of OECD and the climate change indicators dashboard of IMF, among others. Additional fields in the metadata, such as rationale and limitations, will also be considered for inclusion;

(c) Continuing to improve the attribution to climate change or the relevance of the indicators to climate change by narrowing the scope and definition of several indicators or introducing new disaggregation items. This requires the development of new classifications (e.g. on human health and diseases, and climate-induced disasters) or revision of existing ones (e.g. on expenditure and environmental activities);

(d) Following up policy and science to identify new indicators to be included in the global set of climate change statistics and indicators in future revisions, and also to possibly remove certain indicators from the list.

Development of training materials and strategies for capacity development and resource mobilization

37. The Statistics Division, in collaboration with the secretariat of the United Nations Framework Convention on Climate Change and other relevant bodies, would develop training materials and strategies for capacity development and resource mobilization by:

(a) Developing a strategy with key partners to promote bridging the gap between policy and statistics and between national statistical offices and climate change reporting agencies at the national level;

(b) Developing implementation guidelines for national consultations and data-sharing processes on climate change statistics;

(c) Developing training materials, including e-learning modules, organized according to thematic areas, along with guidance and best practices, on addressing climate change issues by including climate change-related questions in national censuses and surveys, and best practices on the dissemination of climate statistics;

(d) Mobilizing resources to facilitate the training of trainers, based on the assessment of the capacity development needs in the countries revealed by the global consultation;

(e) Developing a climate change assessment tool similar to the Environment Statistics Self-Assessment Tool.²²

38. At the country level, national statistical offices would:

(a) Develop national climate change statistics programmes using the global set of climate change statistics and indicators as the framework for climate change statistics and indicators and continue to assess the availability of data for the indicators and statistics according to the tiering system;

(b) Continue to strengthen their collaboration with the national focal points for the United Nations Framework Convention on Climate Change (or national authorities responsible for reporting climate change-related information);

(c) Continue to be more involved in the preparation of data submissions to the secretariat of the United Nations Framework Convention on Climate Change, for supporting the implementation of the Paris Agreement;

(d) Advocate to have a more central role in coordinating climate change statistics based on their mandates to produce official statistics and their role in coordinating national statistical systems;

(e) Strengthen environment statistics, using the Framework for the Development of Environment Statistics, as the basis for developing climate change statistics, given their close interrelationship;

²² See <https://unstats.un.org/unsd/envstats/fdes/essat.cshtml>.

(f) Enhance data collection in the area of climate change statistics by conducting specialized climate change surveys or including related modules in existing surveys and censuses;

(g) Produce and disseminate climate change statistics via dedicated reports, websites or other means.

VI. Action to be taken by the Statistical Commission

39. **The Commission is invited:**

(a) **To adopt the global set of climate change statistics and indicators as the framework for climate change statistics and indicators and encourage its implementation in countries;**²³

(b) **To consider the need to review the global set in three to five years from its adoption;**

(c) **To urge the international statistical community to expand its capacity development efforts with regard to climate change statistics;**

(d) **To strongly encourage national statistical systems to invest in the development of climate change statistics, in particular environment, energy, agriculture and industry statistics, in their respective countries;**

(e) **To encourage the enhancement of collaboration between national statistical offices and national authorities responsible for reporting climate change-related information to the secretariat of the United Nations Framework Convention on Climate Change, given the increased and more diverse data requirements for the implementation of the Paris Agreement;**

(f) **To consider the activities already undertaken by the Statistics Division and the secretariat of the United Nations Framework Convention on Climate Change to strengthen the link between statistics and policy, such as joint initiatives in the development of climate change statistics and indicators, joint capacity-building efforts and training with other partners, and to propose the continuation of such activities;**

(g) **To urge the donor community to mobilize additional and substantial resources to enable capacity-building in environment and climate change statistics in developing countries;**

(h) **To provide its views on the list of actions in section V outlining the way forward for agencies and countries to further develop climate change statistics and indicators.**

²³ As mentioned in paragraph 30 above, countries may also apply the Conference of European Statisticians set of core climate change-related indicators or other relevant regional sets.

Annex I

Responses from countries, areas and agencies

1. Responses were provided by the following 86 countries and areas: Armenia, Australia, Azerbaijan, Bangladesh, Belarus, Bhutan, Bolivia (Plurinational State of), Botswana, Brazil, Bulgaria, Burundi, Cabo Verde, Canada, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Denmark, Dominican Republic, Ecuador, Estonia, Finland, France, Georgia, Grenada, Guinea, Guyana, Hungary, India, Indonesia, Ireland, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Mauritius, Mexico, Mongolia, Montenegro, Myanmar, Nepal, Netherlands, New Zealand, North Macedonia, Norway, Paraguay, Peru, Philippines, Poland, Qatar, Republic of Moldova, Russian Federation, Saint Lucia, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia, South Africa, Spain, Suriname, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Viet Nam, Zambia, Zimbabwe, Bermuda and State of Palestine.

2. Responses were provided by the following 26 agencies: European Environmental Agency, Eurostat, Caribbean Community, Intergovernmental Panel on Climate Change, Statistical Centre for the Cooperation Council for the Arab States of the Gulf, International Energy Agency, International Monetary Fund, International Organization for Migration, Economic and Social Commission for Asia and the Pacific, Economic Commission for Latin America and the Caribbean, Economic Commission for Africa, Economic Commission for Europe, Economic and Social Commission for Western Asia, Food and Agriculture Organization of the United Nations, Organisation for Economic Co-operation and Development, UNCTAD, United Nations Educational, Scientific and Cultural Organization, United Nations Environment Programme (UNEP), World Conservation Monitoring Centre of UNEP, United Nations University, United Nations Human Settlements Programme, secretariat of the United Nations Framework Convention on Climate Change, United Nations Office on Drugs and Crime, Energy Statistics Section of the Statistics Division of the Department of Economic and Social Affairs of the Secretariat, United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women) and World Bank.

Annex II

Global set of climate change statistics and indicators: list of indicators

Drivers

Total greenhouse gas emissions

1. Total greenhouse gas emissions per year
2. Total emissions of indirect greenhouse gases
3. Greenhouse gas emissions from land use, land use change and forestry
4. Total greenhouse gas emissions from the national economy
5. Greenhouse gas emissions per capita
6. Greenhouse gas emissions in gross fixed capital formation of direct investment
7. Greenhouse gas emissions in value added of foreign-controlled multinational enterprises
8. Carbon footprint

Atmospheric concentration of greenhouse gases

9. Global concentration of greenhouse gases

Energy production, supply and consumption

10. Total primary energy production from fossil fuels
11. Total energy supply from fossil fuels
12. Share of fossil fuels in total energy supply
13. Final energy consumption per capita
14. Energy intensity measured in terms of primary energy and gross domestic product

Fossil fuels

15. Fossil fuel dependency
16. Amount of fossil-fuel subsidies (production and consumption) per unit of gross domestic product

Population

17. Population growth
18. Urban population as a proportion of total population

Transport

19. Number of (fossil-driven) vehicles per capita
20. Vehicle miles travelled per capita

Land and agriculture

21. Intensity of use of forest resources
22. Deforested area as a proportion of total forest area

23. Ratio of area of organic soils drained for agriculture to total area of organic soils
24. Livestock units per agricultural area
25. Use of nitrogen fertilizers per hectare of total agricultural area (cropland and pastures)
26. Growth in built-up area

Impacts

Agricultural production affected by climate change

27. Direct agricultural loss attributed to disasters
28. Crop loss due to climate extremes
29. Impact of climate change on livestock productivity
30. Growing degree days

Areas affected by climate change

31. Forest area as a proportion of total land area
32. Change in snow cover and snow depth
33. Reduction of surface water bodies
34. Change in coasts affected by erosion
35. Reduction of the extent and mass of glaciers

Freshwater resources

36. Renewable freshwater resources per capita
37. Freshwater abstracted as a proportion of renewable freshwater resources
38. Water quality

Hazardous events and disasters

39. Frequency of hazardous events and disasters
40. Direct economic loss to all other damaged or destroyed productive assets attributed to disasters
41. Direct economic loss in the housing sector attributed to disasters
42. Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
43. Number of climate refugees, climate migrants and persons displaced by climate change

Climate change and human health

44. Incidence of cases of climate-related diseases
45. Incidence of heat- and cold-related illnesses or excess mortality
46. Climate-induced air pollution

Climate change evidence

47. Sea level rise

48. Reduction of sea ice cover
 49. Average marine acidity (pH) measured at agreed suite of representative sampling stations
 50. Reduction of lake and river ice cover
 51. Global mean surface temperature anomaly
 52. Mean surface temperature anomaly
 53. Temperature records
 54. Temperature-humidity index
 55. Mean sea surface temperature anomaly
 56. Ocean heat content
 57. Temperature of freshwater bodies
 58. Total rainfall anomaly
 59. Precipitation record
 60. Standardized precipitation index
- Soil condition*
61. Change of land area affected by soil erosion
- Distribution and status of species*
62. Proportion of populations maintained within species
 63. Red List index
 64. Species habitat index
 65. Rate of invasive alien species spread
- Distribution and status of ecosystems*
66. Reduction in the extent of natural and semi-natural ecosystems
 67. Proportion of forest area affected by forest fires
 68. Phytosanitary status of forest
 69. Ecosystem integrity index
 70. Ecosystem connectivity
 71. Proportion of land that is degraded over total land area
 72. Proportion of fish stocks within biologically sustainable levels
 73. Increase in area affected by coral bleaching
- Production and consumption of materials*
74. Impact on production of wood and non-wood products
- Climate change impacts on transport and critical infrastructure*
75. Damage to critical infrastructure attributed to disasters

76. Direct economic loss resulting from damaged or destroyed critical infrastructure attributed to disasters

77. Impacts of climate change on transport

Climate change impacts on tourism

78. Reduction in tourist arrivals following climate-related hazardous events

79. Damage to natural heritage and sites of tourist interest

80. Direct economic loss to cultural heritage damaged or destroyed attributed to disasters

Vulnerability

Water security, food security and agriculture

81. Prevalence of undernourishment

82. Balance of food trade

83. Customer price of drinking water

84. Water production cost

85. Area of biofuels (and other non-food crops) as a proportion of total agricultural area

86. Population relying on subsistence and pastoral farming

Vulnerable species, ecosystems and their services

87. Vulnerable species

88. Vulnerable or fragile ecosystems

89. Vulnerable ecosystem services

90. Ecosystem carbon stocks

Buildings and infrastructure vulnerable to climate change

91. Infrastructure vulnerable to climate change

92. Buildings (settlements) vulnerable to climate change

Vulnerable population

93. Coverage of essential health services

94. Net energy imports as a proportion of total energy supply

95. Proportion of population with access to electricity

96. Proportion of population served by municipal waste collection

97. Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water

98. Proportion of population using safely managed drinking water services

99. Proportion of population with access to heating/cooling

100. Proportion of population living in coastal areas

101. Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)
102. Proportion of population living in non-coastal hazard-prone areas
103. Proportion of urban population living in slums, informal settlements or inadequate housing
104. Indigenous population living in isolated areas
105. Proportion of population with disability

Area of country vulnerable to climate change

106. Coastal area vulnerable to climate change
107. Islands vulnerable to climate change
108. Water bodies vulnerable to climate change impacts

Mitigation

Renewable energy

109. Production of renewable energy as a proportion of total energy production
110. Renewable energy share in the total final energy consumption
111. Non-fossil fuel energy consumption as a proportion of final energy consumption
112. Proportion of population with primary reliance on clean fuels and technology
113. Rate of decrease of energy intensity

Climate change mitigation policies, strategies and plans

114. Low-carbon development strategies and plans
115. Reforming or phasing out of government support for fossil fuels, by fuel type and type of support
116. Share of climate change mitigation expenditure in relation to gross domestic product
117. Share of energy- and transport-related taxes as a percentage of total taxes and social contributions
118. Amounts provided and mobilized in United States dollars per year in relation to the continued existing collective mobilization goal of the \$100 billion commitment through to 2025
119. Average trading carbon price

Climate change mitigation technology and practice

120. Climate change mitigation technology
121. Trade in low-carbon technology products
122. Greenhouse gas intensity of the economy (including transport)
123. Rate of decrease of greenhouse gas emissions per unit of gross domestic product
124. Greenhouse gas removals (carbon sequestration)
125. Increase in forest area
126. Progress towards achieving the nationally determined contribution

Adaptation

Climate change adaptation policies, strategies and plans

- 127. Proportion of sectors planning, budgeting and implementing climate change adaptation actions
- 128. Proportion of women in managerial positions
- 129. Share of government adaptation expenditure in relation to gross domestic product
- 130. Number of units dedicated to climate change in government structures
- 131. National integrated coastal zone management
- 132. Fisheries management measures in place and multilateral/bilateral fisheries management arrangements

Risk management, disaster forecasting and early warning systems

- 133. Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies
- 134. Coverage of disaster shelters per capita
- 135. Climate change funds received
- 136. Coverage of early warning systems
- 137. Average increase of insurance premiums incurred due to climate change

Public awareness of and education on climate change

- 138. Proportion of population with access to climate information
- 139. Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
- 140. Number of companies publishing sustainability reports
- 141. Number of reports on climate change statistics and indicators

Area-based adaptation to climate change

- 142. Adaptation at coastal zones or river basins
- 143. Nature-based adaptation
- 144. Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
- 145. Share of green urban areas in the total area of cities
- 146. Proportion of degraded area of ecosystems that has been restored
- 147. Buildings adapted to climate change
- 148. Proportion of agricultural area under productive and sustainable agriculture
- 149. Progress towards sustainable forest management

Climate change monitoring

150. Biodiversity information monitoring index

151. Meteorological monitoring network

152. Air quality monitoring systems

153. Water monitoring systems

154. Ocean monitoring

Water management

155. Water use per capita

Waste management

156. Municipal waste collected per capita

157. Proportion of municipal waste treated

158. Proportion of domestic and industrial wastewater flows safely treated
