

# Climate Change Statistics and Indicators: Global Set



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**Eighth Meeting of the Expert Group on Environment Statistics  
New York, 12-21 October 2021 (virtual)**

Session 1: Climate Change Statistics and Indicators: Group work - Impacts



# Outline

1. Impacts indicators
2. New indicators
3. Proposed modifications
4. Tier 3 work



# Impacts indicators in the Global Set

20	<a href="#">Crop loss due to climate extremes</a>	2010	3	Agriculture
21	<a href="#">Impact of climate change on livestock productivity</a>	2020	3	Agriculture
22	<a href="#">Forest area as a proportion of total land area (SDG 15.1.1)</a>	2030	1	Forests
23	<a href="#">Change in snow cover and snow depth</a>	2040	2	Snow and ice
24	<a href="#">Reduction of surface water bodies</a>	2050	1	Water resources
25	<a href="#">Change in coasts affected by erosion</a>	2060	2	Sea and coasts
26	<a href="#">Reduction of glaciers extent and mass</a>	2070	2	Snow and ice
27	<a href="#">Renewable freshwater resources per capita</a>	2080	1	Water resources
28	<a href="#">Freshwater abstracted as proportion of renewable freshwater resources</a>	2090	1	Water resources
29	<a href="#">Water quality</a>	2100	3	Water quality
30	<a href="#">Average marine acidity (pH) measured at agreed suite of representative sampling stations (SDG 14.3.1)</a>	2110	2	Water quality
31	<a href="#">Frequency of hazardous events and disasters</a>	2120	1	Disasters
32	<a href="#">Direct economic loss attributed to disasters in relation to global gross domestic product (GDP) (SDG 11.5.2)</a>	2130	2	Disasters
33	<a href="#">Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population (SDG 11.5.1)</a>	2140	1	Disasters
34	<a href="#">Climate refugees, migrant and displaced persons by climate change associated disasters</a>	2150	3	Disasters
35	<a href="#">Increase of cases of climate-related diseases</a>	2160	3	Health
36	<a href="#">Increase in heat and cold related illnesses</a>	2170	3	Health
37	<a href="#">Climate induced air pollution</a>	2180	3	Air quality
38	<a href="#">Sea level rise</a>	2320	2	Sea and coasts
39	<a href="#">Reduction of sea ice cover</a>	2200	3	Snow and ice
40	<a href="#">Reduction of lake and river ice cover</a>	2210	3	Snow and ice
41	<a href="#">Global mean surface temperature anomaly</a>	2230	2	Temperature
42	<a href="#">Mean surface temperature anomaly</a>	2240	1	Temperature
43	<a href="#">Temperature record</a>	2250	2	Temperature
44	<a href="#">Mean sea surface temperature anomaly</a>	2260	2	Temperature
45	<a href="#">Ocean heat content</a>	2270	2	Temperature
46	<a href="#">Temperature of freshwater bodies</a>	2280	3	Temperature
47	<a href="#">Total rainfall anomaly</a>	2290	2	Precipitation
48	<a href="#">Precipitation record</a>	2310	2	Precipitation
49	<a href="#">Standardized precipitation index (SPI)</a>	2300	2	Precipitation
50	<a href="#">Change of land area affected by soil erosion</a>	2410	2	Soil
51	<a href="#">Proportion of population maintained within a species</a>	2420	3	Species
52	<a href="#">Red list index (SDG 15.5.1)</a>	2430	2	Species
53	<a href="#">Species habitat index</a>	2440	2	Species
54	<a href="#">Invasive alien flora and fauna species (FDES 1.2.2.c.3)</a>	2450	2	Species
55	<a href="#">Reduction of natural and semi-natural ecosystems extent</a>	2520	2	Ecosystems
56	<a href="#">Proportion of forest area affected by forest fires</a>	2540	2	Forests
57	<a href="#">Ecosystem health</a>	2550	3	Ecosystems
58	<a href="#">Proportion of land that is degraded over total land area (SDG 15.3.1)</a>	2560	1	Ecosystems
59	<a href="#">Proportion of fish stocks within biologically sustainable levels (SDG 14.4.1)</a>	2570	2	Fisheries
60	<a href="#">Increase of area affected by coral bleaching</a>	2580	2	Ecosystems
61	<a href="#">Reduction of non-wood forest products</a>	2590	3	Forests
62	<a href="#">Impacts of climate change on transport</a>	2600	3	Transport
63	<a href="#">Reduction in tourist arrivals following climate-related hazardous events</a>	2610	3	Tourism
64	<a href="#">Damage to sites of interest, landmarks, beaches, etc.</a>	2620	3	Tourism



# New indicators

UNSD received suggestions for new indicators from 5 countries and 3 international agencies.

These were screened according to the following criteria:

- 1) link to one of the five climate change areas
- 2) suitability for national policy-making and monitoring purposes
- 3) fit into the area/topics structure in a balanced manner
- 4) possible to develop into the indicator/statistic/metadata structure



# Proposed new indicators

			Yes/No
<b>Indicator</b>	<p><b>It should be recognized that climate change might have gendered impact. Women might experience particular gender norms, roles, responsibilities, behaviors and power structures that imply that they experience climate change differently. Accordingly, indicators should attempt to capture heterogeneous climate change impacts through disaggregating the indicators by sex.</b></p>	UN-Women [separate document]	
<b>Indicator Statistic</b>	<p><b>Growing degree-day</b></p> <ul style="list-style-type: none"> <li>• Daily average temperature</li> <li>• Phenological stage</li> </ul>	Country [links in part2]	
<b>Indicator Statistic</b>	<p><b>Humidity index</b></p> <ul style="list-style-type: none"> <li>• Relative humidity</li> <li>• Temperature</li> </ul>	Country [links in part2]	
<b>Indicator Statistic</b>	<p><b>Number/frequency of mass mortality events of aquatic organisms (due to infectious diseases or environment-related factors or unknown causes – until diagnoses)</b></p> <ul style="list-style-type: none"> <li>• Number of emerging diseases</li> </ul> <p><i>[Biosecurity project data; EMPRES/aquatics; Requests for technical assistance from affected countries]</i></p>	FAO	
<b>Indicator Statistic</b>	<p><b>Displacement risk/potential for homeless persons</b></p> <ul style="list-style-type: none"> <li>• Duration of displacement</li> <li>• Number of displacements.</li> </ul>	IOM [separate document]	
<b>Indicator</b>	<b>SDG 11.5.2 - Direct economic loss in relation to global GDP,</b>		

# Proposed modifications (1)

	Global set	Proposed changes	Yes/No
Statistic 2103	Water salinity (FDES 1.3.2.f.2)	Total amount of dissolved salts in water at selected sampling sites	
Statistic 2104	BOD of water resources (FDES 1.3.2.b.1)	BOD5 at selected sampling sites	
Statistic 2105	COD of water resources (FDES 1.3.2.b.2)	COD potassium dichromate at selected sampling sites	
Statistic 2151	Number of people whose destroyed dwellings were attributed to hydro-meteorological disasters (UN-ECE 25)	<ul style="list-style-type: none"> <li>Actionable consumer information needs to be distinguished from general climate change awareness.</li> <li>better to monitor the climate change awareness directly - 'Climate change concerns (% of population)'</li> </ul>	



## Proposed modifications (2)

	Global set	Proposed changes	Yes/No
Indicator 35	Increase of cases of climate-related diseases	<ul style="list-style-type: none"><li>• Suggest that the indicator not defined as "Increase" but rather the variable itself</li><li>• <b>ECE</b>-We would also suggest that the indicator not defined as "Increase" but rather the variable itself. If it is about the change, then perhaps "Change" rather than "Increase" would be more accurate in the name as in some other indicators. We would also recommend including in the name the variable measured - incidence in this case. Perhaps it could be explored whether one approach ("Change" instead of "increase") could be followed throughout the set as there does not seem to be a difference in calculation between "Increase" and "Change" indicators, only in expected value.</li></ul>	



## Proposed modifications (3)

	Global set	Proposed changes	Yes/No
Indicator 36	Increase in heat and cold related illnesses	<ul style="list-style-type: none"> <li><b>ECE</b>-We would suggest that the indicator name indicates the variable measured (e.g. <b>incidence or excess mortality</b>). We would also suggest that the indicator is not defined as "Increase" but rather the variable itself. Overall, Indicators defined as change tend to be more useful for countries far from their policy targets and are less useful for countries that already achieved their goal and have no significant change to show.</li> </ul>	
Statistic 2191	Concentration level of particulate matter (PM2.5) (FDES 1.3.1.a.2)	<ul style="list-style-type: none"> <li>Urban exposure to particulate matter (PM2.5)</li> </ul>	





## Proposed modifications (4)

	Global set	Proposed changes	Yes/No
Indicator 55	Reduction of natural and semi-natural ecosystems extent	<ul style="list-style-type: none"> <li>For the national purposes the indicator is defined as land under natural grassland, forest land, land under wood and bushes, land under swamps and water bodies</li> <li>Percentage change in area under different ecosystems may be computed by NRSC under LU-LC change matrices</li> </ul>	
Statistic 2530	Area of ecosystems (FDES 1.2.2.a.1)	expansion of urban areas and human population put pressure on natural ecosystems	
Indicator 57	Ecosystem health	Area lost due to adverse weather conditions	



## Proposed modifications (5)

	Global set	Proposed changes	Yes/No
Statistic 2191	Concentration level of particulate matter (PM2.5) (FDES 1.3.1.a.2)	<ul style="list-style-type: none"> <li>Urban exposure to particulate matter (PM2.5)</li> </ul>	
Indicator 62	Impacts of climate change on transport	It should also be broken down <b>by mode of transport.</b>	
Indicator 64	Damage to sites of interest, landmarks, beaches, etc.	'Sites of interest' is broad - suggest narrowing the scope of this indicator e.g. to be only about <b>heritage sites of interest; National Parks</b>	



# Tier 3

Indicator 20	Crop loss due to climate extremes	<p><b>24 countries (38%) assessed “yes” for relevance</b>  <b>11 countries responded “yes” to Methodological Soundness</b></p> <ul style="list-style-type: none"> <li>UN Women--Disaggregated by gender. In many parts of the world, women are responsible for agricultural production, and climate changes could affect production and crop susceptibility to disease.</li> </ul>	
Indicator 21	Impact of climate change on livestock productivity	<p><b>24 countries (38%) assessed “yes” for relevance</b>  <b>9 countries responded “yes” to Methodological Soundness</b></p>	
Indicator 29	Water quality	<p><b>28 countries (44%) assessed “yes” for relevance</b>  <b>8 countries responded “yes” to Methodological Soundness</b></p> <ul style="list-style-type: none"> <li>UNEP-- "Statistics"--- Suggest adding 14.1.1 (a): Index of coastal eutrophication:               <ol style="list-style-type: none"> <li>Definition available</li> <li>Source of data available</li> </ol> </li> </ul>	



# Tier 3

Indicator 34	Climate refugees, migrant and displaced persons by climate change associated disasters	<p><b>20 countries (32%) assessed “yes” for relevance</b>  <b>8 countries responded “yes” to Methodological Soundness</b></p> <ul style="list-style-type: none"> <li>UN Women-Disaggregated by gender. Following a disaster, it is more likely that women will be victims of domestic and sexual violence; they even avoid using shelters for fear of being sexually assaulted.  <a href="https://www.undp.org/sites/g/files/zskgke326/files/publications/Resource.pdf">[https://www.undp.org/sites/g/files/zskgke326/files/publications/Resource.pdf]</a></li> <li>IOM- IOM Proposes Indicator: Migrants and displaced persons in the context of disasters and climate change, with Stat 1. Number of displacements in the context of disasters associated with hydro-meteorological and climatic hazards. Stat 2. Number of displacement associated with hydro-met and climatic hazards per 100 000. Reason: 1) The proposed indicator measures “homeless persons”, not displaced persons or migrants. 2) One indicator for all three of these population categories seems a bit reductive? It would be prudent to capture Migrants and IDPs as distinct populations as they have distinct needs.</li> <li>EEA-The proposed indicator does not clearly define who can be considered as climate refugee, climate migrant or a person displaced due to climate change. Also, the indicator focuses only on the populations living in houses or housing units which were destroyed by disasters. The indicator does not capture slow onset events like serious drought, desertification, glacier melt, permafrost thaw or sea level rise and focuses only to rapid hydro-meteorological events causing disasters.</li> </ul>	



## Tier 3

Indicator 40	Reduction of lake and river ice cover	<b>13 countries (21%) assessed “yes” for relevance</b> 5 countries responded “yes” to Methodological Soundness	
Indicator 46	Temperature of freshwater bodies	<b>29 countries (46%) assessed “yes” for relevance</b> 6 countries responded “yes” to Methodological Soundness	
Indicator 51	Proportion of population maintained within a species	<b>25 countries (40%) assessed “yes” for relevance</b> 6 countries responded “yes” to Methodological Soundness	
Indicator 63	Reduction in tourist arrivals following climate-related hazardous events	<b>19 countries (30%) assessed “yes” for relevance</b> 3 countries responded “yes” to Methodological Soundness	
Indicator 64	Damage to sites of interest, landmarks, beaches, etc.	<b>21 countries (33%) assessed “yes” for relevance</b> 3 countries-responded “yes” to Methodological Soundness	



## Optional (on metadata)

- Rationale
- Limitations
- Interpretation
- Compilation formulae
- More disaggregation
- Tier revision



## Optional (on list)

- Linkages among the indicators
- How to handle indicators which belong to more than one area
  - Share of climate change mitigation expenditure in relation to GDP (UN-ECE 30)
  - Share of government adaptation expenditure in relation to GDP (UN-ECE 35)
- Repeated statistics:
  - E.g.: precipitation, sea level rise, land cover, land use, forest area
- Social and economic statistics: GDP and population



# Thank you for your attention!

For more information please contact the Environment Statistics Section  
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Website: <https://unstats.un.org/unsd/envstats/>

Climate Change Statistics Website

<https://unstats.un.org/unsd/envstats/climatechange.cshtml>

and

[https://unstats.un.org/unsd/envstats/ClimateChange\\_StatAndInd\\_global.cshtml](https://unstats.un.org/unsd/envstats/ClimateChange_StatAndInd_global.cshtml)

