DEVELOPING GLOBAL INDICATORS FOR PUBLIC ENGAGEMENT ON CLIMATE CHANGE

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MECCE
MONITORING AND EVALUATING
CLIMATE COMMUNICATION
AND EDUCATION PROJECT

CLIMATE
outreach

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About the MECCE Project

The Monitoring and Evaluating Climate Communication and Education (MECCE) Project was established to respond to these gaps through developing and providing quantitative and qualitative data useful for increasing the quality and quantity of ACE. The MECCE Project is a global collaboration of over 100 Party and non-Party stakeholders, with the UNFCCC, UNESCO, IPCC, and UNESCO GEM Report participating on the Advisory Committee. The MECCE Project works with diverse stakeholders across regions and sectors, including policy makers, educators, youth, and Indigenous peoples. One of the MECCE Project's main components, Indicator Development, collates existing and develops new global datasets, develops indicators based on those data, and homes in on data coverage gaps. The MECCE Project has a variety of activities, such as its Interactive Data Platform, Regional Hub network, Global Climate Communication and Education Blog, and webinars, which are intended to bridge knowledge gaps and connect people across nations and regions working to improve the quality and increase the quantity of ACE.

I. Introduction

Effective public engagement on climate change across all sectors and countries is imperative for spurring the scale and pace of action required to meet the targets outlined in the Paris Agreement. The importance of communicating with the public is recognized by the United Nations Framework Convention on Climate Change (UNFCCC) through its Action for Climate Empowerment, or ACE, work programmes and action plans (Article 6 of the 1992 Convention and Article 12 of the 2015 Paris Agreement.

The overarching goal of ACE is to empower all members of society to engage in climate action through the 'elements' of Education, Training, Public Awareness, Public Participation, Access to Information, and International Cooperation on these issues. The three public-facing ACE elements, Public Awareness, Public Participation, and Access to Information, are concerned with communicating with and engaging the public to educate and inform citizens about climate change and its impacts with the intent to mobilise action. Specifically, they can be defined as:

- **Public Awareness**: outreach programmes or activities that use targeted, systematic communications about climate change to the public. This type of activity may be developed by governments, NGOs, intergovernmental organisations, or other entities.
- **Public Access to Information**: programmes or activities that make information, data, and statistics on climate change available to the public. Technology such as databases and the internet, often including accessibility in multiple languages, help to facilitate this provision of information.
- **Public Participation**: efforts to mobilise the public in climate mitigation and adaptation activities and to integrate public perspectives in policy decision-making, community action, or policy advocacy.

In 2021, the UNFCCC parties adopted the 10-year Glasgow Work Programme on ACE, with a 4-year Action Plan to implement the work programme being adopted in 2022. Activities under the work programme are focused on four priority areas: Policy Coherence; Coordinated Action; Tools and Support; and Monitoring, Evaluating and Reporting (MER). The addition of MER in the Glasgow Work Programme priorities highlights the need for data to assist in rapidly progressing ACE within the short timeframes available.

Comparable data on country-level ACE activity is important for supporting decision-making and spurring increased, effective action. However, there is a global lack of capacity and infrastructure to benchmark, target-set, and track ACE implementation and progress. Further, many contexts are also currently grappling with what constitutes quality ACE, which means that current monitoring schemes may be tracking the progress of less effective ACE.

In this Report

This report is intended to provide a roadmap for the development of global indicators of the public engagement-related ACE elements. The report briefly overviews the research literature on public engagement on climate change; reports on a series of new global indicators of Public Awareness, Access to Information, and Public Participation; and provides actionable insights for monitoring, evaluating, and reporting on ACE progress into the future.

The indicators reported here are based on accessible, high-quality, non-self-reported data and available at no cost on the MECCE Project's Interactive Data Platform. The indicators reported here are intended for end use by policy- and decision-makers in intergovernmental,

governmental, organizational, research, and other contexts working to progress ACE through monitoring and evaluation within and across national and regional contexts.

II. Prior Research on Public Engagement on Climate Change

Climate change communication has been studied since the 1980s, first within the field of psychology, and then in other social sciences (Grundmann and Stehr, 2010; Nerlich et al., 2010; Capstick et al., 2015; Fløttum, 2017; Eise et al., 2020). Review studies show that in the 1980s and 1990s, rising awareness about climate change turned into concern in the early 2000s, and polarisation and scepticism towards the 2010s. During the 2020s, awareness grew that climate change is human made and increasingly more urgent (Marlon et al., 2022). According to Corner et al. (2021) there is a near universal awareness about climate change in developed countries, which is also spreading to the rest of the world.

Increased awareness of climate change can likely be attributed to the historically predominant use of cognitive approaches in climate change communication (McKenzie, 2019). Cognitive approaches focus on increasing knowledge of climate change, including its underlying anthropogenic and biophysical causes, impacts, and potential solutions (Meadows, 1999). However, research suggests that holistically integrating cognitive approaches with socio-emotional approaches (which address emotions and feelings about climate change and its impacts), and action or behavioural approaches (which foster climate action at both individual and collective levels) is likely to result in stronger climate action (e.g., UNESCO, 2021; Hargis & McKenzie, 2020; Ardoin et al., forthcoming).

Discussions around climate change have been fraught with power struggles between different worldviews and social groups (Burke et al., 2015). For instance, while people living in collectively organized societies see climate change as a large concern, whereas those in countries with largely individualistic worldviews tend to down-play or even deny climate change (Corner et al., 2021). Further, media coverage in the Global North tends to depict climate change as an issue occurring in faraway places and impacting others (Leiserowitz et al., 2013; Su et al., 2017).

Unfortunately, CCC research has mainly focused on Global North contexts, especially North America and Europe (e.g., Metag, 2017; Schäfer and Schlichting, 2014), with few studies drawing on information from Africa, Latin America and the Caribbean, and the Middle East (Eise et al., 2020). A recent comprehensive analysis found that nearly 70% of 255 CCC research studies examined used data from Europe and North America (Eise et al., 2020), and CCC studies are disproportionately found in and about the USA (e.g., Boykoff and Boykoff, 2004), Canada (e.g., Ahchong and Dodds, 2012; Young and Dugas, 2012), and Australia (e.g., Bacon and Nash, 2012). Given that many Global South countries and communities are hardest hit by climate change, there is a strong need for the Global South to be represented in CCC research.

III. Global Indicators of Public Engagement on Climate Change

This section describes the methods and findings of five global indicators of public engagement on climate change, relationships between the indicators, and limitations of the data. The indicators provide an entry point for future discussions and conceptual work and provide a roadmap for developing new global indicators in the future.
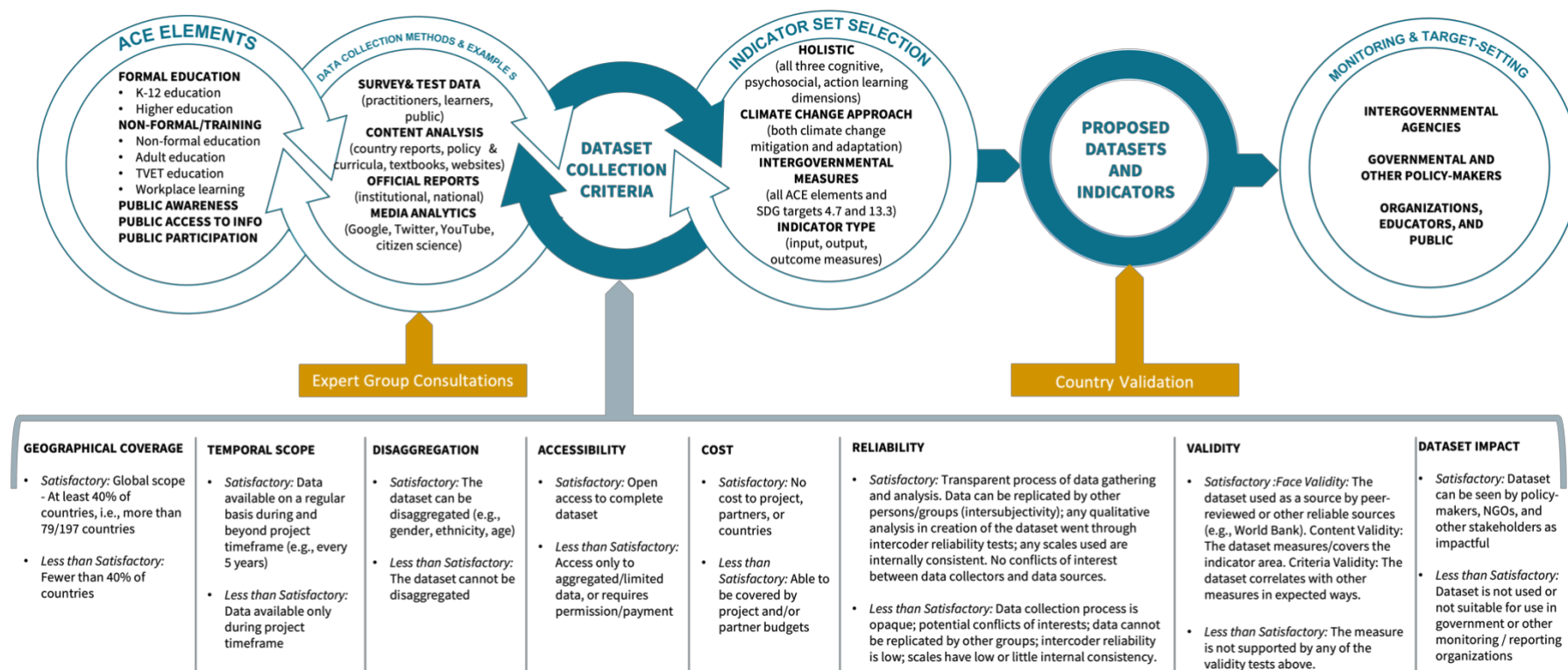
Methods

Indicators are proxy measures for complex systems. There are several types of indicators, which capture different kinds of activity. For example, indicators can measure inputs (e.g., allocated resources), outputs (e.g., curricula, policy commitments), processes (e.g., inclusion of marginalized groups in decision making), and outcomes (e.g., learning achievements, increased competencies). Input and output indicators are more common because data collection is easier; however, due to their simplicity, input and output indicators offer limited insights about attitude and behaviour changes resulting from exposure to ACE (Pizmony-Levy, 2018; Tilbury, 2007). Outcome-oriented indicators are being increasingly prioritized in ACE, although meaningful data are more difficult to collect, particularly at the scale required to develop national and global indicators (Pizmony-Levy, 2018; Tilbury, 2007).

Dataset Selection

The indicators in this report are the result of a comprehensive identification, review, and analysis of existing and potential data sources, which is shown in Figure 1. The process involved: 1) operationalizing the ACE elements to develop indicator measures, 2) identifying a diversity of potential datasets, 3) applying selection criteria to determine the suitability of potential datasets for indicator development, 4) ensuring that the data cover key indicator areas, and 5) translating the variables into clear indicator measure. The MECCE Project's Indicator Expert Group, Indicator Working Group, and country experts provided input into the Project's indicators.

Overall, this research points to a clear need for better quality and variety of data on holistic CCC, and for better data coverage across countries. Only a few datasets were of sufficient quality for monitoring and evaluation purposes. Countries with higher Gross Domestic Products tended to have more available data, and the data tended to be higher quality. No dataset covered all three learning dimensions and the cognitive learning dimension is the most prominent, which aligns with prior research studies described above. Limited datasets were available to annually monitor changes in public engagement related to climate change. Given how quickly public views of climate change shift, regularly tracking these patterns over time is key to effective policy planning and implementation. See Appendix A for a detailed overview of the dataset review process and how this set of indicators was developed.

Figure 1: MECCE Project indicator development lifecycle

ACE ELEMENTS

FORMAL EDUCATION
- K-12 education
- Higher education

NON-FORMAL/TRAINING
- Non-formal education
- Adult education
- TVET education
- Workplace learning

PUBLIC AWARENESS
PUBLIC ACCESS TO INFO
PUBLIC PARTICIPATION

DATA COLLECTION METHODS & EXAMPLES

SURVEY& TEST DATA
(practitioners, learners, public)
CONTENT ANALYSIS
(country reports, policy & curricula, textbooks, websites)
OFFICIAL REPORTS
(institutional, national)
MEDIA ANALYTICS
(Google, Twitter, YouTube, citizen science)

DATASET COLLECTION CRITERIA

INDICATOR SET SELECTION

HOLISTIC
(all three cognitive, psychosocial, action learning dimensions)
CLIMATE CHANGE APPROACH
(both climate change mitigation and adaptation)
INTERGOVERNMENTAL MEASURES
(all ACE elements and SDG targets 4.7 and 13.3)
INDICATOR TYPE
(input, output, outcome measures)

PROPOSED DATASETS AND INDICATORS

MONITORING & TARGET-SETTING

INTERGOVERNMENTAL AGENCIES

GOVERNMENTAL AND OTHER POLICY-MAKERS

ORGANIZATIONS, EDUCATORS, AND PUBLIC

Expert Group Consultations

Country Validation

GEOGRAPHICAL COVERAGE
- *Satisfactory:* Global scope - At least 40% of countries, i.e., more than 79/197 countries
- *Less than Satisfactory:* Fewer than 40% of countries

TEMPORAL SCOPE
- *Satisfactory:* Data available on a regular basis during and beyond project timeframe (e.g., every 5 years)
- *Less than Satisfactory:* Data available only during project timeframe

DISAGGREGATION
- *Satisfactory:* The dataset can be disaggregated (e.g., gender, ethnicity, age)
- *Less than Satisfactory:* The dataset cannot be disaggregated

ACCESSIBILITY
- *Satisfactory:* Open access to complete dataset
- *Less than Satisfactory:* Access only to aggregated/limited data, or requires permission/payment

COST
- *Satisfactory:* No cost to project, partners, or countries
- *Less than Satisfactory:* Able to be covered by project and/or partner budgets

RELIABILITY
- *Satisfactory:* Transparent process of data gathering and analysis. Data can be replicated by other persons/groups (intersubjectivity); any qualitative analysis in creation of the dataset went through intercoder reliability tests; any scales used are internally consistent. No conflicts of interest between data collectors and data sources.
- *Less than Satisfactory:* Data collection process is opaque; potential conflicts of interests; data cannot be replicated by other groups; intercoder reliability is low; scales have low or little internal consistency.

VALIDITY
- *Satisfactory :Face Validity:* The dataset used as a source by peer-reviewed or other reliable sources (e.g., World Bank). Content Validity: The dataset measures/covers the indicator area. Criteria Validity: The dataset correlates with other measures in expected ways.
- *Less than Satisfactory:* The measure is not supported by any of the validity tests above.

DATASET IMPACT
- *Satisfactory:* Dataset can be seen by policy-makers, NGOs, and other stakeholders as impactful
- *Less than Satisfactory:* Dataset is not used or not suitable for use in government or other monitoring / reporting organizations

Datasets

The five Global Indicators presented below are based on three third-party datasets, the Gallup World Poll, the Global Data Barometer, and the Climate Change Opinion Survey, which use data either from surveys or desk-research and expert interviews. Table 1 shows the years of data collection, number of participants and countries covered, and regional distribution for each dataset.

Table 1: Dataset Sample and Geographic Information

Dataset	Year	# Participants	# Countries Covered	Regional Distribution*						
				SSA	NAWA	CSA	ESEA	LAC	O	ENA
World Risk Poll	2019	154,195	139	71%	83%	86%	81%	58%	13%	87%
World Risk Poll	2021	125,912	118	46%	58%	79%	81%	55%	13%	84%
Global Data Barometer	2021	NA	105	42%	58%	64%	56%	70%	13%	62%
Climate Change Opinion Survey	2022	107,527 - 108,946	101-103	32%	76%	64%	63%	61%	13%	67%

* Sub-Saharan Africa (SSA); Northern Africa and Western Asia (NAWA); Central and Southern Asia (CSA); Eastern and South-Eastern Asia (ESEA); Latin America and the Caribbean (LAC); Oceania; Europe and Northern America (ENA).

World Risk Poll Survey (2019 & 2021)

The indicator, "Perception of climate change as a serious threat," uses third-party data from the World Risk Poll, which is part of the Gallup World Poll funded by the Lloyd's Register Foundation. Data collection was done in 2019 and 2021, primarily through in person interviews in the major conversational languages of each country or territory (although some countries use telephone interviews). This dataset is available free of charge and updated every two years.

The samples comprise over 150,000 participants in 139 countries (2019), and 125,000 participants in 118 countries (2021). The survey sample is randomly selected and nationally representative. Gallup weights the World Risk Poll data using a variable that considers variables such as household size, gender, age, and countries' population size. For more information, see Lloyd Register Foundation, 2021).

Fewer countries were surveyed in 2021 due to the COVID-19 pandemic. When looking at the percentage of countries surveyed in each Sustainable Development Goal (SDG) Region, country coverage is very poor in the Oceanian region, where only 13% of the region's countries (only New Zealand and Australia are included). Country coverage for Sub-Saharan Africa, Northern Africa and Western Asia, and Latin America and the Caribbean are between 50%-60%, particularly in 2021.

Global Data Barometer (2021)

The indicator "Availability of information on climate change impacts" is based on the Global Data Barometer, a global benchmark that provides an overall comparative assessment of the extent to which data is governed, shared, and used for the public good. Data are collected through a mix of desk reviews, interviews, and expert surveys. The Barometer's researchers use a structured decision-making process to assign countries scores on a scale of 0 to 100.

Data were collected from 105 UNFCCC countries from 2019-2021. Countries in Latin America and the Caribbean have the strongest representation in the dataset, closely followed by Central and Southern Asia. Oceania has the fewest countries with available data, with only Australia and New Zealand contributing data. See Table 1.

Climate Change Opinion Survey (2022)

Three indicators, "Perceived impact of climate change on future generations," "Public perception of frequency of exposure to climate change information," and "Adult willingness to participate in climate action," are based on the Climate Change Opinion Survey, which is a partnership between Meta's Data for Good program and the Yale Program on Climate Change Communication. Country-level data are publicly available and free of charge.

As shown in Table 1, the sample includes nearly 110,000 active Facebook users (18+) from over 100 UNFCCC countries. The survey, which is collected in several languages, is intended to be conducted annually. The pilot took place in a limited number of countries in 2021 and the first full-scale survey was conducted in 2022. The data are weighted by Meta and the Yale Program on Climate Change Communication (Leiserowitz et al., 2022) to approximate national representativeness. While country coverage is lacking in the Oceanian region; the Northern Africa and Western Asian region has the largest representation with 76% of countries included in the sample.

Data Preparation and Interpretations

To create the indicators, data were downloaded, cleaned, and prepared for the indicator calculations by either excluding non-UNFCCC countries or merging territories, when possible, with the official country they are associated with. Reliability checks were also conducted. In cases where the data were weighted (e.g., by countries' population size, participant demographics), a check was conducted to confirm that weighting was correct. Weighting scores were provided by the original data sources.[1]

In most cases, the indicators are based only on the most extreme possible answer option to the question being asked of respondents, which simplifies interpretation. For example, the indicator based on World Risk Poll data is based on the percentage of survey respondents who see climate change as a "Very Serious Threat."

As shown in Table 2, the percentages or the scores assigned to each country ranged from 0 to 100. This range was converted into a five levels scale, where 1 is the lowest, and 5 is the highest. The levels represent increasing intervals of 20%, meaning that level 1 comprises countries with a percentage between 0 and 20% and level 5 comprises countries with a percentage of 80% or higher. In the case of the Public Access to Information indicator, given the high number of countries (24) that scored 0, the level 1 contained all the countries with scores of 0. For the levels 2 to 5, the levels represented countries with up to 25 points, 50

points, 75 points, and 100 points, respectively. A more detailed description of the data source and the indicator calculations are available on the MECCE Project's Interactive Data Platform.

Table 2: Indicator levels for the World Risk Poll, Climate Change Public Opinion Survey, and Global Data Barometer

Data Source	Level 1	Level 2	Level 3	Level 4	Level 5
World Risk Poll	0 to 20%	21% to 40%	41% to 60%	61% to 80%	81% to 100%
Global Data Barometer	0	1 to 25	26 to 50	51 to 75	76 to 100
Climate Change Opinion Survey	0 to 20%	21% to 40%	41% to 60%	61% to 80%	81% to 100%

Public Awareness Indicators

Perception of Climate Change as a Serious Threat

The indicator, "Perception of climate change as a serious threat," uses the 'Very Serious Threat' response from the World Risk Poll survey question: "Do you think that climate change is a very serious threat, a somewhat serious threat, or not a threat at all to the people in this country in the next 20 years? If you do not know, please just say so."

As shown in Figure 2, overall, Latin America and the Caribbean is the most concerned region, with an average level of concern of around 65% in both years. The second most concerned region is Europe and North America, with European Union countries displaying higher levels of concern than North American countries. Countries in Central and Southern Asia and Northern Africa and Western Asia have average levels of concern of 38% in both years. Missing data is shown in grey in the figure; the data coverage gaps in Sub-Saharan Africa and Oceania are apparent.

Figure 2: Percentage of countries in each indicator level for the "perception of climate change as a serious threat" indicator, by SDG region (2019 & 2021)
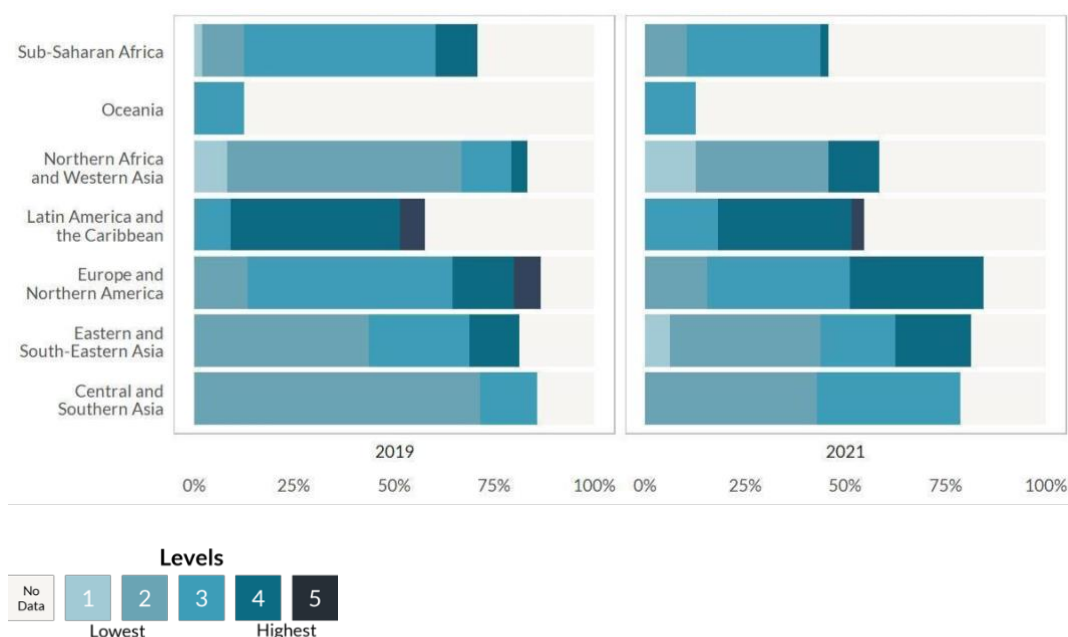
Note: Level 1 = 0% to 20% of respondents said 'Very Serious Threat'; Level 2 = 21% to 40% of respondents; Level 3 = 41% to 60%; Level 4 = 61% to 80%=; and Level 5 = 81% to 100%.

Figure 3 maps the indicator levels by country for 2019 and 2021. Countries in South America score the highest, with Chile having the highest indicator level of any country in both years of the survey, with 88% of respondents seeing climate change as a very serious threat in both years. At the country level, four countries (Greece, Costa Rica, Portugal, and Spain) dropped from Level 5 to Level 4 between 2019 and 2021. Countries throughout Asia tend to score lowest. In 2019, Yemen has the lowest percentage with just 13% of the respondents indicating that climate change is a very serious threat to them (Yemen was not surveyed in 2021). In 2021, Egypt is the country with the lowest percentage, with 13% of respondents answering that climate change is a very serious threat.

Figure 3: Country-level overview for the "perception of climate change as a serious threat" indicator (2019 & 2021)
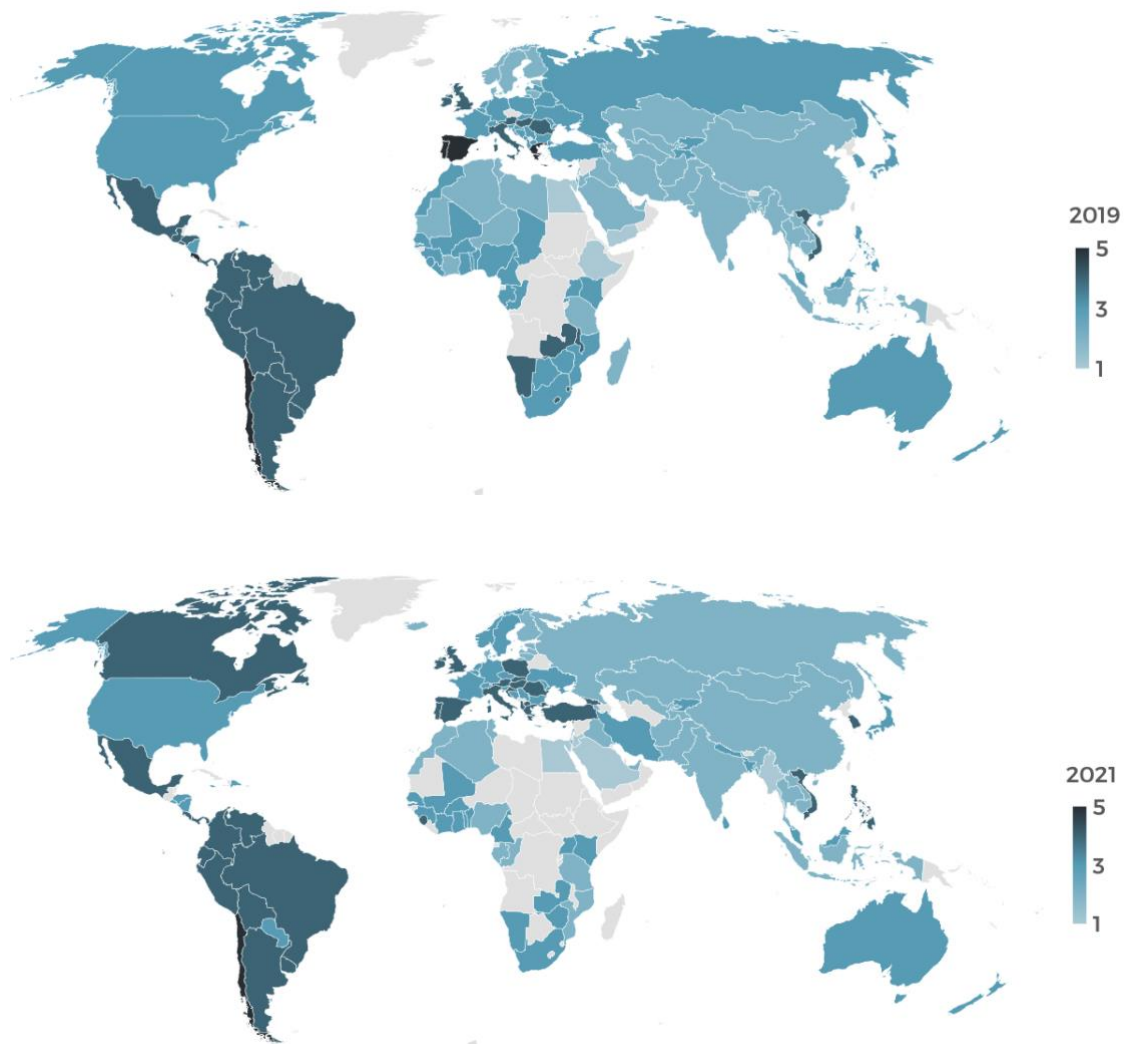
Note: The darker the colour, the higher the indicator level. Missing data is shown in light grey.

Perceived Impact of Climate Change on Future Generations

The indicator for "Perceived impact of climate change on future generations" uses the 'A great deal' response to the 2022 Climate Change Opinion Survey question: "How much do you think climate change will harm future generations of people?"

As shown in Figure 4, respondents in the Latin America and the Caribbean region are more likely to think climate change will harm future generations of people. It is also the only region with countries in indicator level five and countries in this region have an average score of 68%. The region with the lowest proportion of respondents who think climate change will harm future generations is Northern Africa and Western Asia, with only 42% of respondents being more mindful of the impact of climate change on future generations.

Figure 4: Percentage of countries in each indicator level for the "perceived impact of climate change on future generations" indicator, by SDG Region (2022)
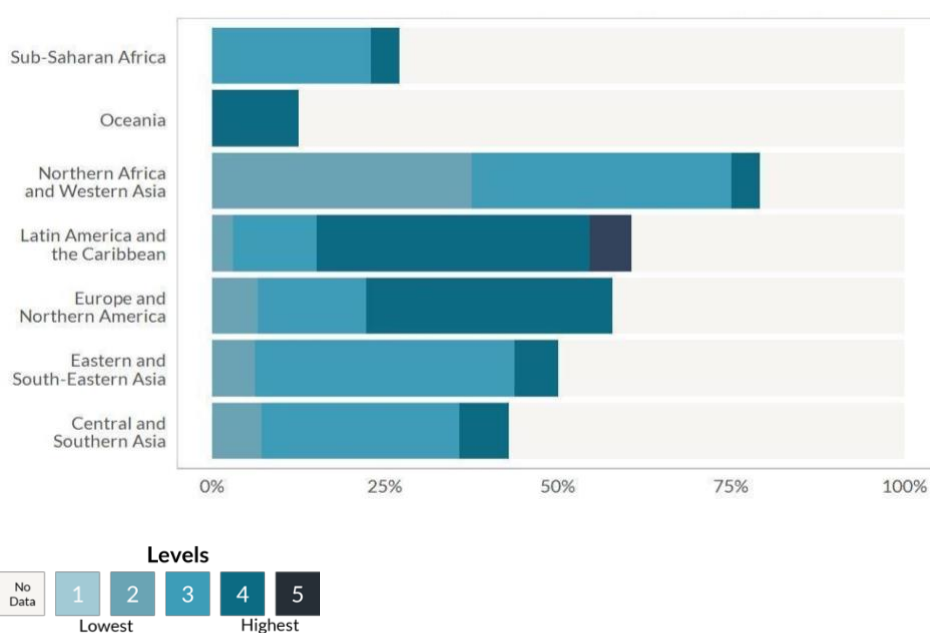
Note: Level 1 = 0% to 20% of respondents said 'A great deal'; Level 2 = 21% to 40% of respondents; Level 3 = 41% to 60%; Level 4 = 61% to 80%=; and Level 5 = 81% to 100%.

At the country level, those classified as Annex I under the UNFCCC and countries in the Latin America and the Caribbean region tend to have high proportions of respondents that think climate change will harm future generations a great deal. By contrast, Non-Annex I countries are less concerned, on average. Yemen has the lowest indicator level, with only 23% of people thinking that future generations will be very impacted by climate change. On the other hand, 83% of Mexicans have the highest levels of awareness, followed by 80% of Chileans. The results are very similar to the indicator "Perception of climate change as a serious threat", based on World Risk Poll data.

Figure 5: Country-level overview for the "perceived impact of climate change on future generations" indicator (2022)
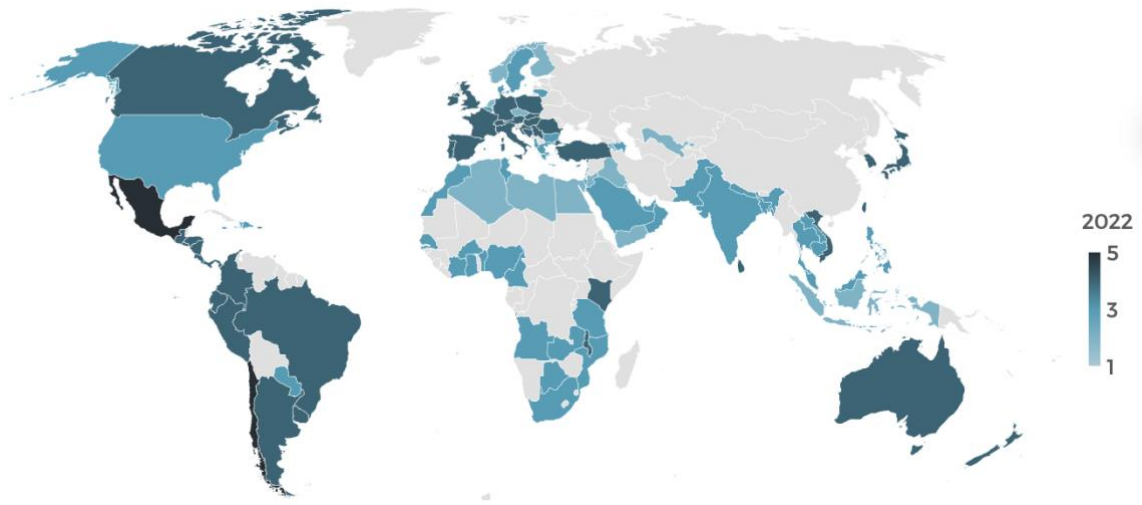
*Note: The darker the colour, the higher the indicator level. Missing data is shown in light grey.*

Public Access to Information Indicators

Availability of Information on Climate Change Impacts

This indicator "Availability of information on climate change impacts" is calculated using the simple average of the following two datasets from Climate Action Module: 1) Extent to which emissions information is available as open access data and 2) Extent to which climate vulnerability information is available as open access data.

When looking at the regional distribution per indicator level (Figure 6), it becomes clear that the availability of data about climate change is a key concern globally. The Central and Southern Asian region scores the lowest, with an average of only 11 out of 100, closely followed by Sub-Saharan Africa, with an average regional score of 13. At the other end of the scale, Oceania has an average of 79 points, although only two countries, Australia and New Zealand contribute data. Europe and North America have an average score of 43.

Figure 6: Percentage of countries in each indicator level for the "availability of information on climate change impacts" indicator, by SDG Region (2021)
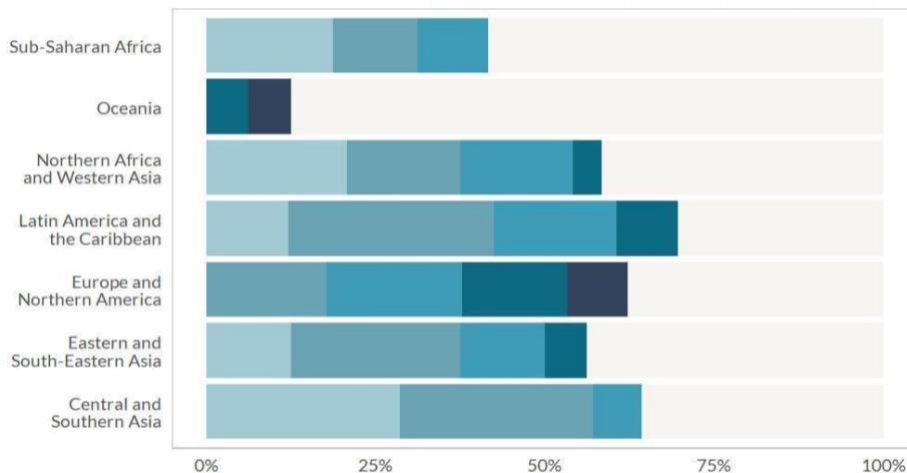
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At the country-level in Figure 7, Annex I countries lead this indicator. New Zealand received the highest score of 95 out of 100, closely followed by the United States of America with 94. Notably, 23% (24) of analysed countries received a score of 0, which highlights the need for increased availability of climate change data, especially in developing countries such as Bangladesh, Cambodia, Croatia, Liberia, Peru, and Saudi Arabia.

Figure 7: Country-level overview for the "availability of information on climate change impacts" indicator (2021)
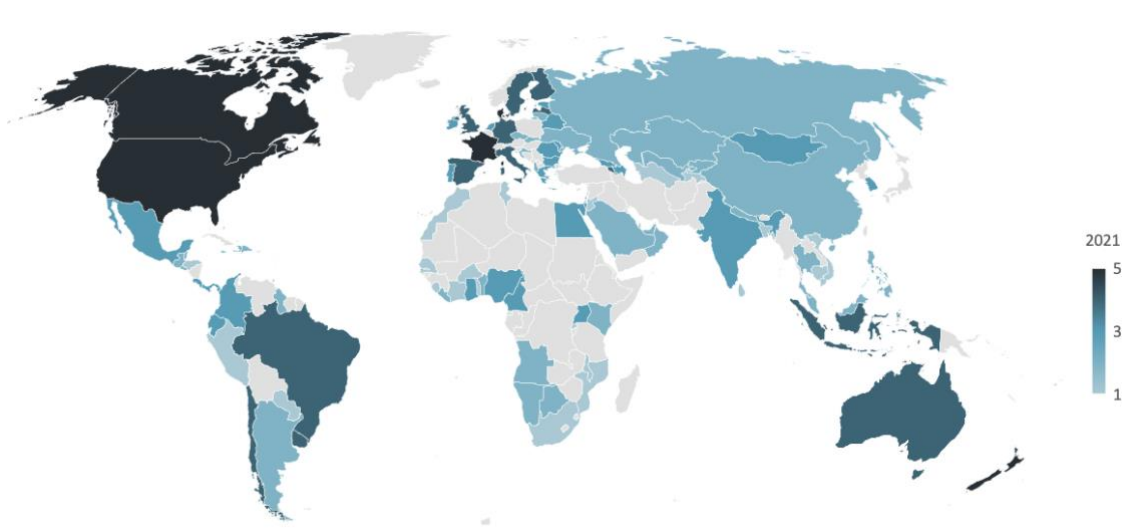
Note: The darker the colour, the higher the indicator level. Missing data is shown in light grey.

Public Perception of Frequency of Exposure to Climate Change Information

This indicator uses the 'at least once per week' response to the Climate Change Opinion Survey question: "How often do you hear about climate change in your daily life (for example from TV, newspapers, social media, or conversations with friends and family)?"

Figure 8 shows the indicator's regional distribution. Similarly to the previously discussed Public Access to Information Indicator "Availability of information on climate change impacts," Australia and New Zealand, representing Oceania, have the highest amount of perceived exposure, with 55% of respondents indicating they hear about climate change at least once per week. In Europe and Northern America, 43% of respondents indicate they hear about climate change at least weekly. The lowest level of perceived exposure is in Northern Africa and Western Asia, with only 16% indicating that they hear about climate change at least weekly. In Latin America and the Caribbean, 22% of respondents indicate hearing about climate change at least once per week.

Figure 8: Percentage of countries in each indicator level for the "public perception of frequency of exposure to climate change information" indicator, by SDG Region (2022)
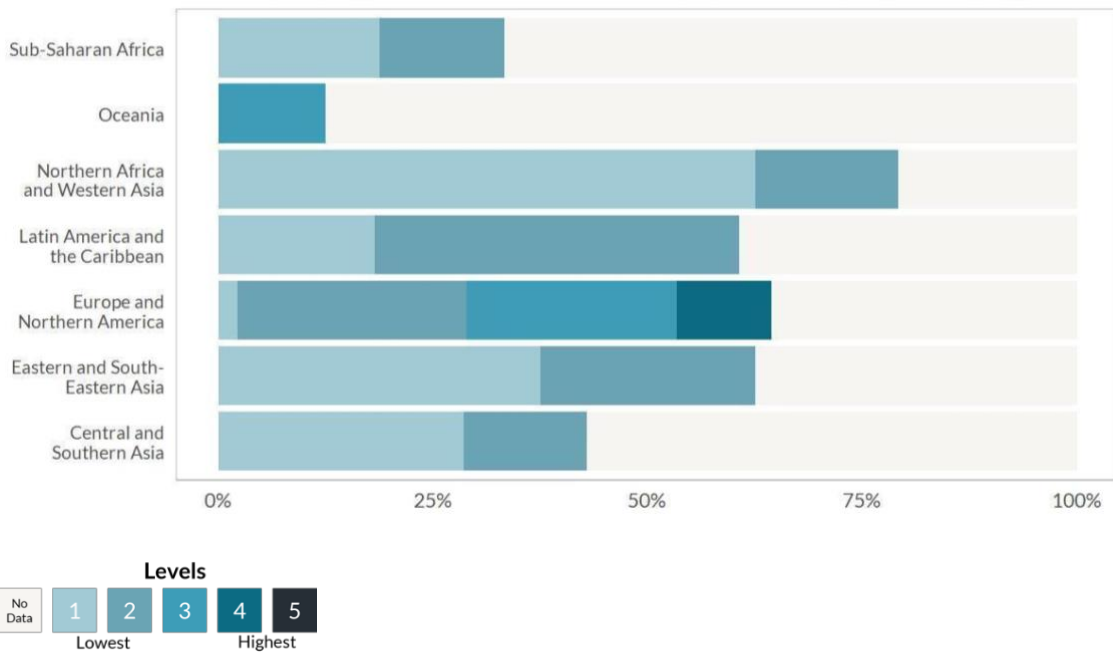
Note: Level 1 = 0% to 20% of respondents said 'at least once per week'; Level 2 = 21% to 40% of respondents; Level 3 = 41% to 60%; Level 4 = 61% to 80%=; and Level 5 = 81% to 100%.

Figure 9 highlights the country-level distribution of this indicator. The top five countries all European: 66% of Swedish and German, 64% of Finnish, 62% of Austrian, and 60% of Danish respondents report hearing about climate change at least once a week. Yemen is the country with the lowest score, with only 7% of respondents reporting they hear about climate change at least once a week. In Cambodia and Algeria, 9% of participants report hearing about climate change weekly.

Figure 9: Country-level overview for the "public perception of frequency of exposure to climate change information" indicator (2022)
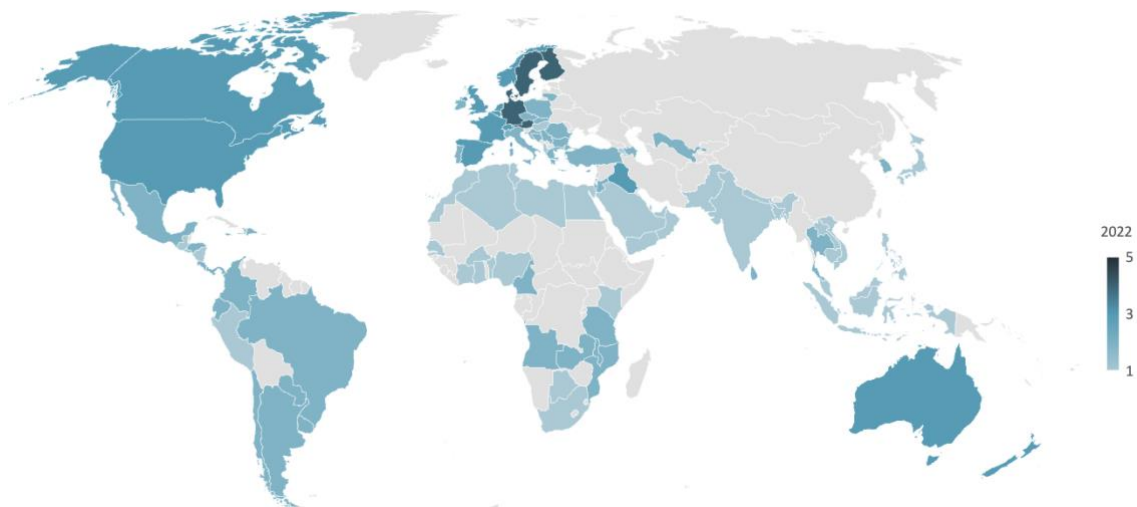
Note: The darker the colour, the higher the indicator level. Missing data is shown in light grey.

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Public Participation Indicator

Adult Willingness to Participate in Climate Action

This indicator uses the 'I am participating in an effort like this now' and 'I definitely would do it' responses to the 2022 Climate Change Opinion Survey question: "How willing or unwilling are you to join a citizens' campaign to convince leaders in [country] to take action to reduce climate change?"

As shown in Figure 10, unlike the other public engagement indicators, Sub-Saharan Africa leads the field with 60% of respondents reporting high willingness to participate in climate action. Central and Southern Asia is the second most engaged region, with 49% indicating active participation. Oceania and Europe and Northern America are at the far end of the scale, with only 18% of respondents in both regions indicating their willingness to participate in climate action.

Figure 10: Percentage of countries in each indicator level for the "adult willingness to participate in climate action" indicator, by SDG Region (2022)
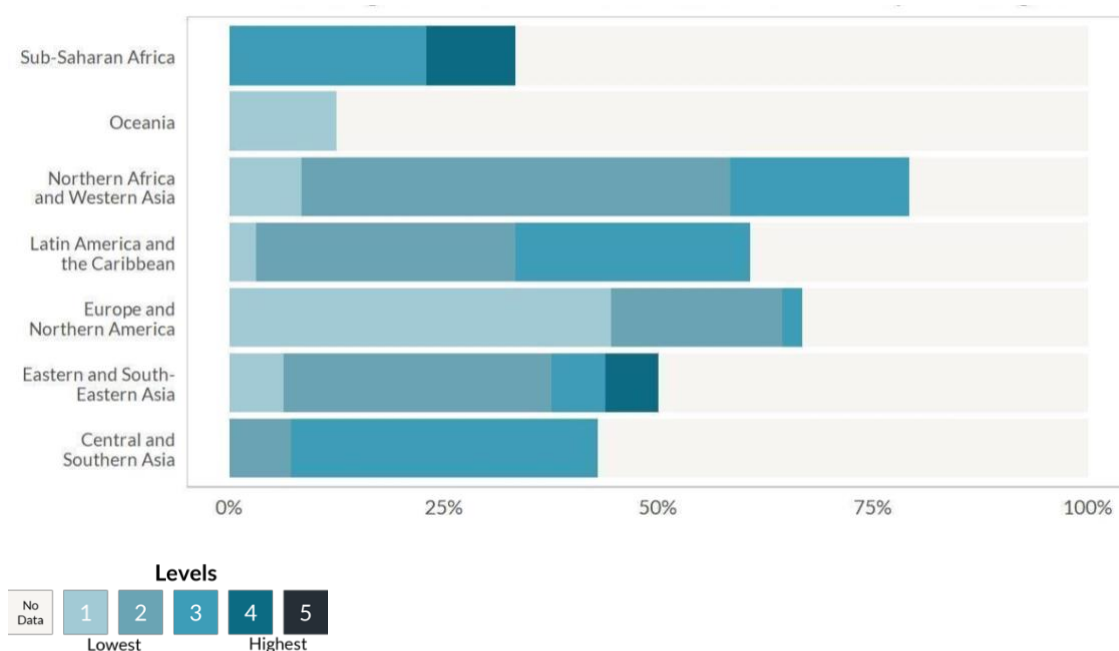
Note: Level 1 = 0% to 20% of respondents said 'I am participating in an effort like this now' and 'I definitely would do it'; Level 2 = 21% to 40% of respondents; Level 3 = 41% to 60%; Level 4 = 61% to 80%=; and Level 5 = 81% to 100%.

Figure 11 maps the distribution of this indicator at the country level. Zambia (75%), Malawi (74%), and Kenya (72%) have respondents showing the highest levels of willingness to participate in climate action. Finland is the least engaged country in this indicator, with only 9% of respondents indicating willingness to participate in climate action. In the Netherlands, Sweden, and Norway, 10% of respondents indicate their willingness to participate in climate action.

Figure 11: Country-level overview of the "adult willingness to participate in climate action" indicator (2022)
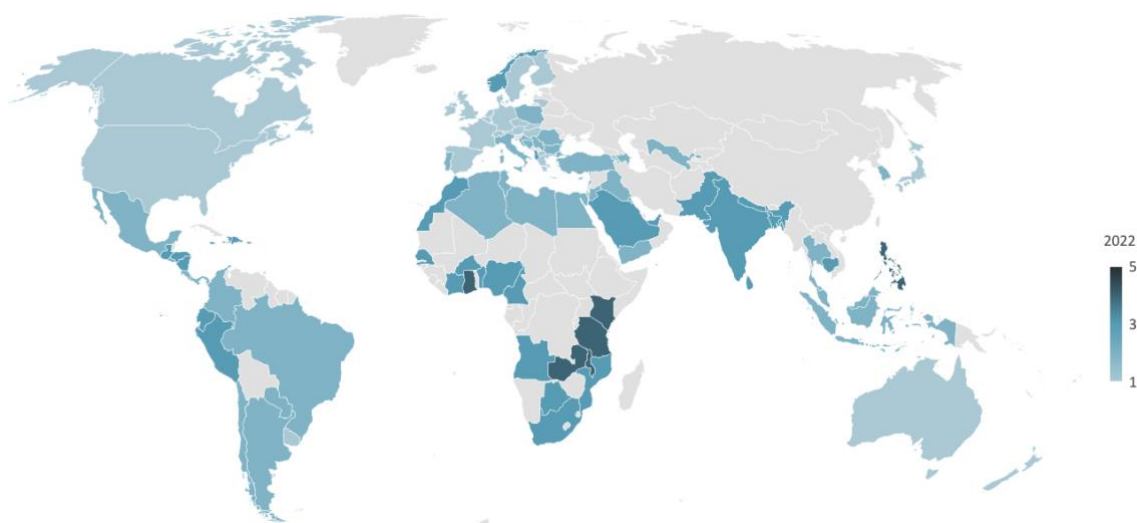
Note: The darker the colour, the higher the indicator level. Missing data is shown in light grey.

Relationships Between the Public Engagement Indicators

The preliminary correlational analysis reported below in Table 3 provides insights into how the individual indicators and ACE elements are related to one another.[2,3]

Table 3: Public engagement indicator correlation matrix

Legend

| Positive high | Positive medium | Positive low | Negative low | Negative medium | Negative high |

ACE Element	Public Awareness			Public Access to Information		Public Participation
Indicator	Perception CC is a Serious Threat		Impact on Future Generations	Availability of Data on CC	Exposure to Information on CC	Willingness to Participate in Climate Action
	(2019)	(2021)				
Perception that CC is a Serious Threat (2019)	1.000					
Perception that CC is a Serious Threat (2021)	0.847***	1.000				
Impact on Future Generations	0.774***	0.797***	1.000			
Availability of Data on CC	0.182	0.201	0.216	1.000		
Exposure to Information on CC	0.425***	0.429***	0.428	0.231*	1.000	
Willingness to Participate in Climate Action	-0.334***	-0.384***	-0.310***	-0.125	-0.634***	1.000

* p=<0.05, ** p=<0.01, *** p=<0.001

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[2] Spearman Correlations (maximum range of -1 to 1) were used using pairwise deletion to minimize the number of lost data due to the non-parametric distribution of some indicators.

[3] The higher the number, the stronger the relationship between the two indicators. A positive number indicates that the two indicators increase or decrease together, while a negative number indicates that when one indicator increases, the other decreases. Relationships are unlikely to have occurred by chance (i.e., are statistically significant) are marked by asterisks.

The correlation matrix in Table 3 shows several interesting relationships between and across the indicators and ACE elements. For example, the two indicators for the Public Awareness ACE element ("Perception of climate change as a serious threat," with two time points, and "Perceived impact of climate change on future generations," with one time point), correlate highly with each other. The same is true for the two Public Access to Information indicators, although the correlations are lower. Significant correlations between indicators that are part of the same ACE element suggest that the data and indicators are capturing similar concepts (i.e., that they have satisfactory content validity) and outcomes (i.e., they have satisfactory criterion validity).

Another trend shown in the correlation table above shows the indicator for "Perception of climate change as a serious threat" was stable between the two time points for which data are available. Specifically, the preliminary analysis shows no statistically significant change between 2019 and 2021 in perceptions of climate change as a serious threat, suggesting public perceptions were relatively stable, on average, between 2019 and 2021.

Finally, the preliminary analysis also includes a result that is, on the surface, counterintuitive. Specifically, the indicator for Public Participation, "Adult willingness to participate in climate action," is negatively correlated with the indicators for the ACE elements of Public Awareness and Public Access to Information. This suggests that, according to our indicators, higher awareness and more information about climate change are not related to increased Public Participation in climate action, at least using the measures selected for indicators to date. It should be noted that the Public Participation indicator is based on the Climate Change Public Opinion Survey, as was the "Impact on Future Generations" indicator, which was not negatively correlated with the other indicators. Therefore, it is likely that the negative correlation is not due to quality issues with the data but rather points to a different phenomenon.

Limitations

Given the global nature of the surveys reported here, there may be cultural differences such as associations and understandings of the terms, interpretations of phrasing, and attitudes towards surveys that affect the way the people in different countries respond. The responses are also self-declared, which also includes certain cultural biases and limitations. To date, data are available for relatively limited timeframes, which limits the ability to draw conclusions. Finally, For the data collected via social media, the sample is likely not representative of the general population due to the selective nature of Facebook users and while Facebook is the largest social media platform by numbers, it is not used equally across the global population.

V. Looking Forward

Monitoring, evaluation, and reporting of public engagement with climate change specifically, and ACE more broadly, provides useful information on whether and how climate change communication is contributing to the fight against climate change. Comparable data on country-level ACE activity is important for supporting decision-making and spurring increased, effective action. However, our extensive review of available data suggests that high quality comparative data on country-level public engagement with climate change and ACE are generally lacking. Moreover, there are few organizations with the expertise and capacity to compile such data, calculate indicators, and interpret the meaning of those indicators over time. As a result, there is a strong need for global indicators and associated data to support benchmarking, target setting, and tracking progress.

This report provides a roadmap whereby compilation of existing datasets supports development of global indicators of public engagement of climate change, and provides the ability to track changes in the indicators over time. The initial set of five global indicators described in this report provide insights into the landscape of public engagement with climate change, at global, regional, and national levels. Overall, the Global North (Europe and Northern America as well as Australia and New Zealand) and Latin America and the Caribbean show high levels of Public Awareness, as indicated by perceptions that climate change represents a serious threat and that climate change will have a serious impact on future generations. The "Perception of climate change as a serious threat" indicator shows increasing levels of concern amongst countries in the Global North between 2019 and 2021. These same regions also show higher levels of Public Access to Information, specifically in relation to the availability of information on climate change and citizens' perceptions of how frequently they are exposed to information on climate change. Unsurprisingly, the indicator for the Public Participation ACE element shows overall low levels of willingness to participate in climate action. The indicators also show that level of concern and availability of data do not go hand in hand: many countries with little available information on climate change are highly concerned about climate change. For example, while Latin America and the Caribbean was the most concerned region for the Public Awareness indicators, Europe and Northern America lead the field when it comes to availability of information. The availability of good quality data in the Latin America and Caribbean region was unexpected, and a MECCE Project paper (Cosamalon, Posada, & Benavot, 2023) highlights the strengths and challenges of developing public engagement indicators for climate change in the region.

In reality, five indicators covering three ACE elements represents a fraction of the indicators needed to accurately capture as complex a phenomenon as public engagement with climate change. However, even this relatively small number of indicators offers a compelling view into the power of indicators to uncover surprising and intricate phenomena. For example, the indicators for Public Participation were negatively correlated with the indicators for Public Awareness and Public Access to Information—a finding which seems counterintuitive on the surface. However, this finding is consistent with the 'learning dimensions' model, which predicts that cognitive learning (i.e., increased awareness of, and access to information on, climate change) in the absence of engaging psychosocial and action-oriented learning dimensions may disempower target audiences and contribute to decreased climate action. However, future research is needed to explore this phenomenon in greater depth, particularly since low climate action is likely to also be indicative of a lack of resources to support provision of ACE at the scale needed to address the climate crisis. There is also some evidence to suggest that individuals who respond "climate change is a threat" may not feel that climate change should be addressed. For example, Knutti (2019) shows that individuals who feel strongly against issues like climate change "know" a lot about the issue (thus are very aware) but that additional information is used to buttress climate denialism and inaction.

In general, the extensive review of existing datasets has found few data sources of sufficient quality for developing indicators. The challenge created by this lack of data is multifaceted. More work is needed to develop data and associated indicators to sufficiently represent all types of ACE activity. For example, the findings from the indicator of willingness to participate in climate actions is reported here as being part of the Public Participation ACE element; however, the UNFCCC definition shows that the intention of this ACE element is to further Public Participation in *climate change-related decision making* (see, for example, UNESCO & UNFCCC, 2016). Further, the indicators in this report have coverage gaps in Africa, Oceania, and Asia, particularly the indicators of Public Access to Information and Public Participation. Few studies draw on information from Africa, Latin America and the Caribbean, and the Middle East (Eise et al., 2020), and the lack of information is likely to hamper ACE progress in

those regions. Moreover, there is an overall lack of data to develop process- and outcome-related indicators, which would be more helpful for uncovering what good quality ACE is in diverse contexts, and improving our understandings of what learners are taking away from ACE.

In combination, this suggests that more work needs to be done to create new data and improve existing data sources, particularly for countries with data gaps. The MECCE Project is currently engaged in data development activities to expand the diversity of data types to increase our ability to capture ACE activity. This work involves developing data, including through innovative methods such as hashtag analysis and natural language processing, and working with data partners to include ACE content in assessments, in conjunction with using already existing datasets. The country profiles measures reported here are an example of a mechanism for creating data through manual reviews of documents and websites. The country profiles measures support examinations of country intentions to develop responses to climate change (e.g., through legal frameworks, policies, and plans), which can assist with establishing benchmarks and baselines against which to measure activities. The country profiles also support collection of good practices of public engagement related to climate change, and ACE activities more broadly, and are useful for peer learning and identifying opportunities to coordinate on actions and develop coherent policies across national and regional contexts. Further, by providing narrative and contextual information, country level activity can be considered in more nuanced ways than the broader activity captured by national-level quantitatively oriented indicators.

The partnership approach employed to conduct this research, whereby researchers and organizations work together to monitor, evaluate, and report to benchmark and track ACE progress, demonstrates the power of partnerships in addressing this pressing global issue. Given the limited resources available for ACE globally, partnerships between researchers and non-specialist ACE stakeholders are necessary for building capacity to develop and use data and indicators alongside qualitative contextual information to inform decision-making. Regional and global networks to support peer learning and sharing of experiences are an important way forward to coordinate on clear, time-bound approaches to monitoring, evaluation, and reporting of quality ACE ways that are not cost-prohibitive for any one country or organization.

This report outlines a roadmap for partnership approaches to develop indicators of public engagement with climate change, and Action for Climate Empowerment, which can be used by stakeholders across the ACE ecosystem. This roadmap can help support more robust benchmarking, increase ambition in target-setting, and provide more achievable means of tracking progress. Used effectively, monitoring, evaluation, and reporting can accelerate progress and build momentum towards mobilizing the scale and speed of action needed to achieve a global transition to more just, post-carbon societies.

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Appendix A: Dataset Review Procedure

The dataset review process included, first, identifying any existing data sources that already contained a set of relevant data or measures, and second, those existing datasets to which ACE-related data could be potentially added. The latter type of datasets would entail expanding an existing dataset by adding a (series of) ACE items and potentially helping to save on cost and thus increase the feasibility of monitoring ACE through the dataset.

The initial inclusion criteria in the search for existing datasets considered multi-country datasets with national-level measures related to any ACE elements. The process of searching and identification also included team discussions and brainstorming. As advised in the indicator development lifecycle, the identified datasets were classified according to their geographical coverage, temporal scope, accessibility, cost, validity, and impact. Additionally, dataset details such as the funding source or the associated learning dimension (cognitive, social/emotional, action/behavioural) were recorded.

A spreadsheet was used to track relevant information about each data source reviewed (including existing and the potential datasets). This file was used to make decisions on which datasets to pursue further. Spreadsheet rows catalogue the different datasets or data sources reviewed, while columns correspond to the indicator development lifecycle diagram criteria. For documents not in English, relevant information has been translated.

Finally, the exploration included considering potential new datasets that can be proposed and developed, such as new content analysis methodologies or digital analytics that can be feasibly and sustainably collected over time, in terms of cost and effort. These ideas were developed through researcher meetings.

Indicator Areas and Proposed Indicators

Specific indicators for each of the ACE elements were proposed based on literature review, the indicator catalogue built through the dataset review process, and collection/analysis feasibility. The latter considers that some of the identified data sources may hold considerable potential but may not be feasible to use until later in the MECCE Project. Whenever possible, proposed indicator areas were associated with existing datasets. This document supported the following indicator development as it allowed to identify indicator areas currently lacking data.

For each dataset identified or proposed, our RAs included the information described below, including the green/yellow colour coding.

Category	Column	Field	Field entry / options
Dataset identification	A	Dataset ID	Create a correlation ID for each new dataset (e.g., D083 after D082)
	B	Data source / Dataset	Name of the dataset
	C	Potential ACE Element	One or more of the following: - Education: Primary and Secondary - Education: Higher and Post-graduate - Training (CCE in Adult Non-Formal Education / Lifelong learning / TVET / Workplace learning) - Public Awareness - Public Participation - Public Access to Information - International Cooperation

Category	Column	Field	Field entry / options
	D	Defined ACE Element for indicator set	Leave blank if the dataset has not been considered for the Indicators sheet; otherwise, use ACE Element(s) identified in the Indicators sheet.
	E	Status of existing dataset	1. Existing CCE dataset (ready to use in indicators, either accessible or not). 2. In process (of data collection or building CCE dataset). 3. Potential CCE dataset (requiring MECCE work or external agreement).
	F	Status of future dataset	1. In process CCE dataset (explicitly related to climate change) 2. In process related dataset (related to ESD, GCED, SD, Environment, etc.) 3. No CCE/related dataset announced
	G	Potential dataset	1. Introduce CCE in recurrent data collection 2. Analyse data to build CCE dataset 3. No usable data identified
	H	Notes	Space for MECCE team notes
Dataset information	I	Description of Dataset	Brief description of the dataset
	J	Type of Data	"Survey"; "Content Analysis"; "Other"
	K	URL	URL/link of the dataset, where already existing
	L	Owner	Name of the main company or organization responsible for the data collection, dataset, or data archive
	M	Funded by	Name of main organization(s) funding the data collection
Geographical Scope	N	UNFCCC Country coverage (most recent dataset)	Number of UNFCCC countries/parties covered (largest quantity since 2020 or latest)
	O	UNFCCC LAC country coverage (most recent dataset)	Number of UNFCCC Latin America and the Caribbean countries/parties covered (largest quantity since 2020 or latest). Column used for the Axis 2 LAC paper.
	P	Population coverage	Estimate of population represented by the dataset
	Q	SDG regions coverage	Number of regions covered, out of the 7 SDG regions (count if at least 1 country per SDG region): Sub-Saharan Africa; Northern Africa and Western Asia; Central and Southern Asia; Eastern and South-Eastern Asia; Latin America and the Caribbean; Oceania; Europe and Northern America
	R	Geo Scope ideal?	Satisfactory: Global scope - At least 40% of countries, i.e., 79/197 or more countries (confirming some from each SDG region for finalized datasets)
			Less than satisfactory: Fewer than 40% of countries, i.e., fewer than 79/197 countries (confirming some from each SDG region for finalized datasets)

Category	Column	Field	Field entry / options
Temporal Scope	S	Time Period of Data Available	Year range of the time period of the existing datasets (e.g., earliest year the data are available, to the most recent year data are available)
	T	# of Rounds of Data Collected	Number of times the existing dataset has been collected (e.g., 10 if the dataset has been collected annually for 10 years, or if it has been collected 10 times over the last 50 years)
	U	Planned Frequency of Data Collection	"Annually"; "Monthly"; "Daily"; "# years"; "# months"; "One-off"
	V	Next Planned Data Collection	Year (and month if known) of the next planned data collection
	W	Temp Scope ideal?	Satisfactory: Data available on a regular basis during and beyond project timeframe (e.g. every 5 years)
			Less than satisfactory: Data available only during project timeframe (i.e., one off)
Accessibility	X	Type of access	"Open access" (to full dataset); "MECCE partner" (can have access to full dataset); "Only access to aggregated data"; "Payment"
	Y	Access ideal?	Satisfactory: Open access to complete dataset
			Less than satisfactory: Access only to aggregated data, limited access to data, or with permissions or payment
Cost	Z	Cost in USD	Cost of dataset in USD per round of data collection
	AA	Cost description	"Free"; [short explanation of costs]
	AB	Cost ideal?	Satisfactory: No cost to project, partners, or countries
			Less than satisfactory: Able to be covered by MECCE Project and/or partner budgets
Validity	AC	Sample survey question and/or assessment items	Copy sample item and response options
	AD	Data subjects	Brief description of the data subjects (e.g., students, universities, NDCs)
	AE	Sample size (avg)	Sample size of the dataset (average rounds if more than one round collected)
	AF	Representativeness	Short description on whether representative samples where used from the covered countries
	AG	Use in policy / Peer-revision evidence	Short description on current or potential use in government or intergovernmental processes; evidence of peer revision
	AH	Validity ideal?	Satisfactory: Suitable for use in government or intergovernmental processes; Measure is supported by peer-reviewed papers and sample is nationally representative

Category	Column	Field	Field entry / options
			Less than satisfactory: Less suitable for use in government or intergovernmental processes; Measure is supported by peer-reviewed papers or sample is nationally representative
Learning Dimensions	AI	Cognitive	"X" if the dataset includes data relevant to cognitive learning (learning to know)
	AJ	Psychosocial	"X" if the dataset includes data relevant to socio-emotional learning (learning to be), justice, or socio-cultural learning (learning to live together)
	AK	Action	"X" if the dataset includes data on behavioral or action-oriented learning (learning to do)
Disaggregation variables	AL	Sex	Researcher notes on sex disaggregation
	AM	Ethnicity	Researcher notes on ethnicity disaggregation
	AN	Age	Researcher notes on age disaggregation
	AO	Income	Researcher notes on income disaggregation

Appendix B: Promising Existing Datasets

Dataset name	Description	Period [rounds collected]	Next data	Indicator type	Learning dimension	Subject focus	ACE element
Climate Change: OECD DAC External Development Finance Statistics	OECD quantitative report on bilateral and multilateral climate-related external development finance flows at the activity level (sub-sector "Democratic participation and civil society").	2000-2019 [20]	2022	Input	Cognitive, Action	Climate change	Public Participation
United Nations Treaty Collection	Signatories of the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean.	2018-2022	2022	Input	Cognitive, Social-emotional, Action	Environ. issues	Public Participation, Access to Information
Gallup World Poll	Gallup survey that polls representative samples of households in a large sample of countries (150+). Eligible participants are aged 15 and above. Measures satisfaction with government efforts to preserve the environment.	2005-2021 [15]	2022	Output	Cognitive	Environ. issues	Public Awareness
Media and Climate Change Observatory (MeCCO)	Led by the University of Colorado Boulder among other institutions, MeCCO monitors the appearance of "climate change" and "global warming" in 127 sources (across newspapers, radio and TV) in 59 countries in seven different regions of the world.	2004-2021 [57]	2022	Output	Cognitive	Climate change	Access to Information
Open Government Partnership (OGP) Commitments	Data on the content and performance for all OGP commitments since 2011. The information is derived from OGP action plans and reporting from the Independent Reporting Mechanism (IRM).	2011-2022	2022	Input	Action	Climate change	Public Participation, Access to Information

Dataset name	Description	Period [rounds collected]	Next data	Indicator type	Learning dimension	Subject focus	ACE element
Programme for International Student Assessment	Recurrent test and survey that measures 15-year-olds' ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges.	2000-2021 [7]	2024	Outcome	Cognitive	Environ. issues	Public Participation
WHO Health and Climate Change country survey	Conducted every three years, this survey tracks global progress on health and climate change issues. National data are constructed by surveying ministries of health as well as other health stakeholders and ministries. Asked about the implementation of national public health campaigns on climate change and health.	2017-2021 [2]	2023	Output	Cognitive, Social-emotional, Action	Climate change	Public Awareness
The Lloyd's Register Foundation (LRF) World Risk Poll	Implemented by Gallup, this survey targets nationally representative samples of the population aged 15 and above and covers the biggest risks faced globally (e.g., risks for women, safety of food, workplace injury and harassment, climate change, online safety).	2019-2021 [2]	2023	Outcome	Cognitive, Social-emotional	Climate change	Public Awareness
World Values Survey	International research program devoted to the study of social, political, economic, religious and cultural values of people. The recurrent multi-country survey targets people aged 18 and above. Measures the share of the population involved in a voluntary environmental group.	1981-2020 [7]	2022	Outcome	Cognitive, Social-emotional, Action	Environ. issues	Public Participation

Appendix C: Indicator Data Example

Country or Territory	Gender	Percentage of population who think that climate change is a very serious threat, by gender	Percentage of population who think that climate change is not a threat at all, by gender
Afghanistan	Male	45.3%	6.8%
	Female	29.5%	10.9%
Albania	Male	53.8%	11.3%
	Female	51.4%	8.0%
Algeria	Male	26.0%	14.7%
	Female	25.1%	13.6%
Argentina	Male	67.8%	10.4%
	Female	76.0%	5.4%
Armenia	Male	40.0%	14.2%
	Female	35.0%	12.8%
Australia	Male	45.6%	21.0%
	Female	57.9%	9.9%
Austria	Male	61.9%	9.8%
	Female	64.4%	5.0%
Azerbaijan	Male	30.0%	13.6%
	Female	32.9%	11.4%
Bahrain	Male	32.2%	25.1%
	Female	32.1%	19.7%
Bangladesh	Male	36.5%	10.4%
	Female	21.7%	10.5%
Belarus	Male	42.1%	21.2%
	Female	43.0%	14.3%
Belgium	Male	57.4%	6.7%
	Female	57.9%	4.3%
Benin	Male	47.0%	14.3%
	Female	35.4%	15.6%
Bolivia	Male	72.7%	7.0%
	Female	66.2%	9.3%
Bosnia Herzegovina	Male	54.8%	4.0%
	Female	54.0%	3.0%
Botswana	Male	52.3%	11.7%
	Female	47.8%	8.7%
Brazil	Male	74.8%	7.2%
	Female	69.7%	6.3%
Bulgaria	Male	37.5%	9.7%
	Female	46.8%	5.6%
Burkina Faso	Male	59.3%	6.0%
	Female	48.9%	5.2%
Cambodia	Male	32.3%	6.1%
	Female	19.2%	9.3%
Cameroon	Male	45.3%	14.6%

Country or Territory	Gender	Percentage of population who think that climate change is a very serious threat, by gender	Percentage of population who think that climate change is not a threat at all, by gender
	Female	38.5%	14.3%
Canada	Male	53.3%	12.1%
	Female	59.6%	5.1%
Chad	Male	48.8%	11.3%
	Female	40.8%	10.4%
Chile	Male	87.2%	3.5%
	Female	87.7%	2.4%
China	Male	25.6%	13.9%
	Female	21.0%	10.4%
Colombia	Male	80.7%	5.7%
	Female	73.3%	7.6%
Congo Brazzaville	Male	51.0%	17.6%
	Female	39.3%	25.1%
Costa Rica	Male	84.8%	4.7%
	Female	79.3%	5.2%
Croatia	Male	49.8%	4.6%
	Female	51.6%	5.5%
Cyprus	Male	77.8%	6.1%
	Female	76.4%	2.0%
Denmark	Male	35.5%	13.4%
	Female	41.1%	4.3%
Dominican Republic	Male	58.7%	17.5%
	Female	52.4%	19.9%
Ecuador	Male	79.6%	5.0%
	Female	69.3%	6.1%
Egypt	Male	16.3%	27.7%
	Female	18.9%	22.0%
El Salvador	Male	67.1%	9.1%
	Female	57.2%	11.8%
Estonia	Male	25.0%	21.5%
	Female	40.5%	10.1%
Eswatini	Male	73.0%	3.2%
	Female	66.9%	2.9%
Ethiopia	Male	16.4%	40.3%
	Female	18.5%	38.4%
Finland	Male	19.5%	27.2%
	Female	35.8%	8.7%
France	Male	58.1%	4.8%
	Female	59.6%	3.1%
Gabon	Male	58.3%	9.7%
	Female	43.6%	11.6%
Gambia	Male	51.7%	13.6%
	Female	47.9%	14.3%

Country or Territory	Gender	Percentage of population who think that climate change is a very serious threat, by gender	Percentage of population who think that climate change is not a threat at all, by gender
Georgia	Male	52.9%	5.0%
	Female	60.3%	3.1%
Germany	Male	50.9%	7.6%
	Female	59.6%	6.0%
Ghana	Male	47.0%	18.8%
	Female	41.6%	17.6%
Greece	Male	80.7%	1.8%
	Female	83.1%	0.8%
Guatemala	Male	65.7%	14.3%
	Female	58.5%	18.9%
Guinea	Male	55.0%	10.2%
	Female	48.6%	9.5%
Honduras	Male	68.2%	15.4%
	Female	62.3%	12.9%
Hong Kong	Male	26.1%	8.0%
	Female	38.2%	3.1%
Hungary	Male	64.2%	3.4%
	Female	67.7%	2.8%
India	Male	37.2%	19.1%
	Female	33.4%	19.6%
Indonesia	Male	33.5%	15.2%
	Female	31.6%	15.9%
Iran	Male	41.3%	9.8%
	Female	38.4%	7.9%
Iraq	Male	33.7%	27.9%
	Female	19.7%	29.2%
Ireland	Male	60.9%	10.4%
	Female	66.0%	8.6%
Israel	Male	34.6%	17.8%
	Female	40.9%	12.7%
Italy	Male	66.8%	6.8%
	Female	68.1%	7.2%
Ivory Coast	Male	40.8%	10.5%
	Female	36.4%	11.5%
Jamaica	Male	66.0%	4.8%
	Female	46.6%	9.4%
Japan	Male	55.8%	6.7%
	Female	59.4%	2.2%
Jordan	Male	27.5%	24.5%
	Female	22.0%	18.8%
Kazakhstan	Male	42.9%	12.9%
	Female	35.2%	8.5%
Kenya	Male	66.9%	7.6%

Country or Territory	Gender	Percentage of population who think that climate change is a very serious threat, by gender	Percentage of population who think that climate change is not a threat at all, by gender
	Female	49.4%	8.9%
Kosovo	Male	53.2%	12.9%
	Female	44.4%	8.9%
Kuwait	Male	32.5%	18.1%
	Female	40.0%	13.4%
Kyrgyzstan	Male	42.7%	12.2%
	Female	45.5%	9.8%
Laos	Male	33.1%	9.4%
	Female	19.6%	6.9%
Latvia	Male	39.5%	9.8%
	Female	44.4%	7.1%
Lebanon	Male	38.1%	12.0%
	Female	31.5%	12.6%
Lesotho	Male	79.3%	9.0%
	Female	76.7%	6.4%
Liberia	Male	53.4%	17.5%
	Female	52.7%	18.3%
Libya	Male	26.7%	24.7%
	Female	22.0%	24.6%
Lithuania	Male	20.6%	31.4%
	Female	33.7%	17.1%
Luxembourg	Male	52.0%	6.6%
	Female	56.9%	5.3%
Madagascar	Male	45.5%	14.3%
	Female	34.6%	17.8%
Malawi	Male	76.8%	3.9%
	Female	73.3%	4.1%
Malaysia	Male	43.3%	7.2%
	Female	37.3%	8.3%
Mali	Male	58.9%	10.0%
	Female	45.1%	20.8%
Malta	Male	64.0%	4.6%
	Female	56.9%	4.2%
Mauritania	Male	40.4%	11.3%
	Female	36.1%	9.4%
Mauritius	Male	56.8%	8.6%
	Female	45.0%	13.3%
Mexico	Male	73.1%	7.7%
	Female	68.6%	6.6%
Moldova	Male	38.4%	11.2%
	Female	51.7%	6.4%
Mongolia	Male	36.9%	5.1%
	Female	35.1%	3.3%

Country or Territory	Gender	Percentage of population who think that climate change is a very serious threat, by gender	Percentage of population who think that climate change is not a threat at all, by gender
Montenegro	Male	39.1%	8.0%
	Female	44.7%	6.8%
Morocco	Male	49.8%	8.6%
	Female	43.0%	3.9%
Mozambique	Male	39.4%	17.2%
	Female	41.5%	13.7%
Myanmar	Male	27.3%	20.1%
	Female	15.6%	22.0%
Namibia	Male	67.6%	9.1%
	Female	63.5%	8.2%
Nepal	Male	38.2%	12.4%
	Female	28.3%	8.0%
Netherlands	Male	40.2%	17.7%
	Female	41.0%	5.6%
New Zealand	Male	39.3%	14.2%
	Female	51.5%	7.5%
Nicaragua	Male	57.3%	14.5%
	Female	48.4%	16.0%
Niger	Male	38.6%	15.0%
	Female	34.6%	22.0%
Nigeria	Male	48.4%	16.7%
	Female	40.5%	11.7%
North Macedonia	Male	57.8%	5.6%
	Female	55.9%	5.7%
Norway	Male	32.0%	23.1%
	Female	45.0%	5.4%
Pakistan	Male	37.8%	15.3%
	Female	28.5%	13.4%
Palestine	Male	27.7%	18.3%
	Female	28.2%	17.0%
Panama	Male	68.0%	11.2%
	Female	68.9%	9.3%
Paraguay	Male	73.0%	7.4%
	Female	71.1%	5.9%
Peru	Male	77.8%	3.7%
	Female	64.2%	5.5%
Philippines	Male	57.3%	15.9%
	Female	57.7%	11.2%
Poland	Male	51.9%	8.6%
	Female	52.3%	7.5%
Portugal	Male	78.0%	4.6%
	Female	85.9%	1.5%
Romania	Male	74.8%	4.2%

Country or Territory	Gender	Percentage of population who think that climate change is a very serious threat, by gender	Percentage of population who think that climate change is not a threat at all, by gender
	Female	70.9%	3.7%
Russia	Male	37.9%	17.4%
	Female	42.4%	10.1%
Rwanda	Male	59.3%	9.4%
	Female	45.3%	8.7%
Saudi Arabia	Male	22.2%	22.3%
	Female	22.5%	14.9%
Senegal	Male	47.9%	8.9%
	Female	42.3%	10.5%
Serbia	Male	52.2%	7.8%
	Female	53.5%	7.1%
Sierra Leone	Male	55.8%	7.9%
	Female	42.8%	7.1%
Singapore	Male	73.1%	4.9%
	Female	72.9%	2.7%
Slovakia	Male	40.5%	5.1%
	Female	48.4%	1.4%
Slovenia	Male	44.7%	13.4%
	Female	55.6%	5.2%
South Africa	Male	62.7%	10.7%
	Female	56.5%	10.6%
South Korea	Male	51.9%	4.6%
	Female	55.2%	4.0%
Spain	Male	81.8%	3.0%
	Female	88.0%	2.9%
Sri Lanka	Male	41.6%	13.2%
	Female	37.4%	8.9%
Sweden	Male	29.0%	18.9%
	Female	50.5%	4.0%
Switzerland	Male	50.3%	14.3%
	Female	56.2%	6.0%
Taiwan	Male	63.1%	4.6%
	Female	56.9%	2.2%
Tajikistan	Male	54.7%	10.4%
	Female	49.8%	10.1%
Tanzania	Male	42.3%	15.9%
	Female	35.7%	15.7%
Thailand	Male	38.8%	15.5%
	Female	35.1%	13.4%
Togo	Male	45.7%	12.7%
	Female	38.7%	9.8%
Tunisia	Male	34.9%	10.3%
	Female	28.4%	12.4%

Country or Territory	Gender	Percentage of population who think that climate change is a very serious threat, by gender	Percentage of population who think that climate change is not a threat at all, by gender
Turkey	Male	48.1%	10.3%
	Female	56.5%	4.5%
Turkmenistan	Male	32.5%	25.8%
	Female	33.8%	19.6%
Uganda	Male	54.5%	11.2%
	Female	54.0%	10.5%
Ukraine	Male	51.4%	9.8%
	Female	53.0%	7.7%
United Arab Emirates	Male	28.5%	23.3%
	Female	21.5%	20.7%
United Kingdom	Male	62.8%	12.4%
	Female	76.7%	2.2%
United States	Male	44.7%	29.3%
	Female	53.7%	12.7%
Uruguay	Male	74.3%	8.6%
	Female	73.6%	5.1%
Uzbekistan	Male	22.8%	31.9%
	Female	22.0%	30.2%
Venezuela	Male	64.9%	11.2%
	Female	60.8%	12.2%
Vietnam	Male	65.4%	3.3%
	Female	58.9%	4.3%
Yemen	Male	16.3%	20.9%
	Female	9.5%	20.6%
Zambia	Male	66.5%	6.2%
	Female	62.7%	5.3%
Zimbabwe	Male	60.7%	11.6%
	Female	57.4%	10.2%

Appendix D: Example Indicator Reference Form

Public Awareness: Perception of climate change as a serious threat	
IDP methods	Up to 20% says 'Very Serious Threat' = 1, Up to 40%=2 ; Up to 60%=3; Up to 80%=4; Up to 100%=5
Findings for publications	**2019 data:** 3 countries are at the bottom of the scale (1): Egypt, Ethiopia and Yemen. 5 countries are at the top of the scale (5) and they are either from the Latin American and Caribbean region or the Europe and North America region: Chile, Spain, Portugal, Costa Rica and Greece. No country had values of 0% nor values higher than 88% In 69 countries more than 50% people think climate change is a very serious threat In 70 countries less than 50% of people think climate change is a very serious threat **2021 data:** 4 countries are at the bottom of the scale (1): Myanmar, Jordan, Egypt and Saudi Arabia. Neither Yemen or Ethiopia were surveyed in 2021. 1 country is at the top of the scale (5): Chile No country had values of 0% nor values higher than 88% In 56 countries more than 50% of the people think Climate Change is a very serious threat In 62 counties less than 50% of the people think Climate Change is a very serious threat The change between the data sets is small, negative, and not statistically different. Datasets across time have a positive and significant correlation (r=0.847; p<0.00) This indicator has a small negative correlation with the MECCE Project's Public Participation Indicator (r=-0.075). The Public Awareness indicator has a positive correlation with both indicators for Public Access to Information (r=0.245; r=0.410).

Indicator summary	
ACE Element(s)	Public Awareness
Indicator name	Perception of climate change as a serious threat
Indicator type	Outcome
Indicator description	This indicator tracks the Public Awareness of climate change by measuring the percentage of national populations (15 yrs +) who responded "Very serious threat" to the question: Do you think that climate change is a very serious threat, a somewhat serious threat, or not a threat at all to the people in this country in the next 20 years? If you do not know, please just say so. The Indicator is based on the World Risk Poll Survey, conducted by face-to-face and telephone interviews. Data are available for 2019 and 2021. Detailed information can be found here.

Indicator justification	This indicator provides information on how serious the general public views the threat from climate change. The prevalence of the view that climate change is a serious threat indicates the level of awareness of climate change. A high level of measured concern (and therefore awareness) can indicate broader support for decision-making to advance climate action. It is possible to track changes to the indicator over time to see evolution of Public Awareness over the next few years.
MECCE justification for prioritizing dataset and indicator	Rationale for selecting dataset and developing indicator: The indicator, developed out of the World Risk Poll Data, fulfills the MECCE Projects data criteria satisfactorily. The dataset is available and it is straightforward to convert into an indicator which belongs to the ACE element Public Awareness. Gender disaggregation is possible. The dataset was created by a neutral third party, increasing the validity of the indicator. Original dataset allowed for the answers "Very serious threat", "Somewhat serious threat", "Not a threat at all", "Don't know". Indicator is only based on the "Very serious threat" response as in a three point Likert scale (together with "I don't know", the extremes have the highest validity given that many people who are unsure would choose the middle answer making the bigger scales more reliable. How is the indicator a good proxy measure of quantity and/or quality of CCE/ACE? If there is a high degree of Public Awareness of climate change it is a reasonable assumption that the percentage of the population which views climate change as a serious threat will also be high. The MECCE Project defines Public Awareness as "Outreach programmes or activities that use targeted, systematic communications to the public. This type of activity may be developed by governments, non-governmental organizations, intergovernmental organizations, or other entities." This indicator will not provide information on the degree to which "outreach programmes" are the cause of the level of Public Awareness. MECCE Project data selection criteria:

Criteria	Assessment	Justification
		(based on the MECCE Project indicator lifecycle approach)
Geographical coverage/ representativeness	Satisfactory.	Data available for 142 countries. 139 countries are UNFCCC parties (71% of UNFCCC parties).
Temporal scope	Satisfactory.	New data available every two years between 2019-2025.
Disaggregation	Satisfactory.	Data can be disaggregated by gender
Accessibility	Satisfactory.	Complete dataset downloadable from website.
Cost	Satisfactory.	No cost to access or use the data.

	Reliability	Satisfactory.	Transparent methods and no apparent conflict of interest.
	Validity	Satisfactory.	Peer-reviewed process, nationally representative samples.
	Impact of the dataset	Satisfactory.	Outcome indicator. Shows need for more outreach and/or readiness to support climate action. Easy to interpret.

Dataset(s) description

Dataset(s)	Brief description of specific dataset used to construct the indicator: The World Risk Poll (which includes a question on climate change) is a module within the Gallup World Poll. Since 2005, The Gallup World Poll has regularly surveyed people in over 160 countries, using randomly selected, nationally representative, samples. The questionnaires are translated into the major conversational languages of each country or territory. The MECCE Project uses the question "Do you think that climate change is a very serious threat, a somewhat serious threat, or not a threat at all to the people in this country in the next 20 years? If you do not know, please just say so. to construct the indicator Perception of climate change as a serious threat Owner of the data if any, and name of data source or dataset, status of data source: The Lloyd's Register Foundation (LRF) World Risk Poll (WRP). LRF is a Registered Charity (Reg. no. 1145988) and limited company (Reg. no. 7905861) registered in England and Wales. The Foundation leads the WRP, a global study of worry and risk, with fieldwork conducted by Gallup Survey Company. Language(s) the dataset is in: English Main funding source for dataset, if any: Lloyd's Register Foundation (LRF) Location of the dataset (include link): Data available at: https://wrp.lrfoundation.org.uk/data-resources/
Data collection methods	Data was collected from a probability-based and nationally representative sample of the resident adult (15+) population. Telephone surveys were used in countries and territories where telephone coverage represents at least 80% of the population, otherwise an area frame design is used for face-to-face interviewing. In most countries and territories, Gallup interviewed approximately 1,000 people as part of the World Risk Poll. At least 30% of completed face-to-face interviews were validated using accompanied interviews, in-person re-contacts or telephone re-contacts. At least 15% of completed telephone interviews were validated by either listening to interviews live or listening to recorded interviews. Complete methodology is available on the WRP website.
Temporal scope	Time period(s) collected data is available: The WRP is a 6-year project (2019-2025), with data collection rounds every 2 years, for a total of 4 rounds. Two rounds of data collection are available for 2019 and 2021.

	Frequency of data collection in the past: 2019 and 2021 (two years apart) Frequency of data collection in the future: Every 2 years until 2025 Change over time: Data available for two new countries in 2021: Czech Republic and Iceland. 23 countries that were included in the 2019 survey are not included in the 2021 due to Covid-19 related hazards or restrictions. 36 countries have a change larger than 1 standard deviation. For the global average, there is a difference of -0.25 points between the 2019 and 2021 datasets, indicating a small, negative, but not significant reduction over time of people that think "*Climate change is a very serious threat*".
Sample size, characteristics, and geographical coverage	The MECCE Project's indicator "Perception of climate change as a serious threat" contains data for 139 countries in 2019 and 118 in 2021 that are UNFCCC parties.. The original dataset from the World Risk Poll included 142 countries in 2019 and 121 in 2021. 2019: 154,195 respondents. 2021: 125, 912 respondents. The World Risk Poll used population statistics to weight the data by gender, age, and, where reliable data were available, education or socioeconomic status in order to create a nationally representative sample. All samples are probability-based and nationally representative of the resident adult (15+) population. The coverage area is the entire country, including rural areas. Country coverage (out of 197 UNFCCC parties) by SDG grouping:

2019	TOTAL	SSA	NAWA	CSA	ESEA	LAC	ANZ	O	ENA
N	139	34	20	12	13	19	2	0	39
%	71%	71%	83%	86%	81%	58%	100%	0%	87%

2021	TOTAL	SSA	NAWA	CSA	ESEA	LAC	ANZ	O	ENA
N	118	22	14	11	13	18	2	0	38
%	60%	46%	58%	79%	81%	55%	100%	0%	84%

Sub-Saharan Africa (SSA); Northern Africa and Western Asia (NAWA); Central and Southern Asia (CSA); Eastern and South-Eastern Asia (ESEA); Latin America and the Caribbean (LAC); Australia and New Zealand (ANZ); Oceania excluding AU and NZ (O); Europe and Northern America (ENA).

Climate justice focus	Efforts were made to include rural populations. Yet, in many countries this was not possible and rural populations were not always well represented in the sampling.

MECCE Project indicator analysis	
Data preparation	All responses for the World Risk Poll module responses were downloaded. Data from the question relevant for this indicator "Do you think that climate change is a very serious threat, a somewhat serious threat, or not a threat at all to the people in this country in the next 20 years? If you do not know, please just say so." was used. Answer possibilities were: ● Very serious threat ● Somewhat serious threat ● Not a threat at all ● Don't know ● Refused To ensure the results are nationally representative according to a variety of dimensions, The responses were weighted using the provided variable "projection_weight", created by Gallup. This weight is specifically calculated for each country and survey round. Since 94% (134 out of 142) of countries had "Refused" (respondents who did not answer the question) percentages below 1%, the category was removed by treating it as missing. On the other hand, some countries had significant "don't know" responses such as Laos (55.4%), Nepal (43.8%), Cambodia (42.6%), Morocco (38.0%), and Bangladesh (36.5%). "Don't know" reflects those that openly don't know how to answer the questions, either for lack of knowledge of the concept, being unsure about the effects, or any other reasons. The question formulated includes the possibility of answering "don't know", perhaps preventing socially desirable responses. As such, it is a valid answer and was kept.
Exploratory analysis	The data for the question of interest were compared to other data collected by the poll from the individual respondents as well as to the country level data. One interesting result was that non-parametric tests showed that for most countries (93 out of 139) there is a significant association between gender and the response distribution to the question. This supports the case for presenting the results disaggregated by gender. This test does not imply a specific direction of the association. This dataset has significant potential for future, additional analysis.
Indicator calculation	One indicator was calculated from this dataset using weighted data. This means that the data was adjusted based on different population and sampling sizes. The weight used, as provided by Gallup, was the weighting variable: PROJWT (projection_weight) for the variable: "Climate Change a Threat" Numerators: Weighted number "Very serious threat" responses. Denominator: Total number of responses to the "Climate Change a Threat" variable weighted by using the variable PROJ_WT_2019 for the 2019 data and the variable PROJ_WT_2021 for the 2021 data, "Refused" responses are treated as missing data. Indicator = (Numerator / Denominator) X 100. Indicator scaled used for IDP: up to 20% says 'Very Serious Threat' = 1; up to 40%=2; up to 60%=3; up to 80%=4; up to 100%=5

Notes for interpretation	Not all of the response categories were selected for inclusion in the indicators. This is because this indicator identifies two populations that are of particular interest; those who are very concerned (and therefore aware) and those who are not very concerned (and therefore prime targets of Public Awareness campaigns). For the time being, the indicator includes only data on the very concerned groups.
Limitations	Potential sources of error: This survey entails a complex sampling design, with two modes of data collection (face-to-face and telephone) and weighting to correct for unequal probabilities of household selection and for post-stratification adjustments. Yet public issue polling is still facing an increasing set of challenges including non-response and social desirability bias. Methodological and conceptual weaknesses: There are clearly cultural differences in the way people may respond to this poll that makes country comparisons less reliable and valid. Assumption that responding "climate change is a threat" implies high Public Awareness. Studies have shown that many of those that feel strongly against issues like climate "know" a lot about the issue (thus are very aware) but that additional information is just used to buttress whatever their belief might be (e.g., that climate is not a threat). Validity concerns: Rural areas were not included in all countries, indicating that marginalized populations might not be represented in the study. There are also general concerns about the validity of public issue polling. Regional inconsistencies: There is no geographical coverage in Oceania besides Australia and New Zealand.
Accreditation	LRF & Gallup (2020). The Lloyd's Register Foundation World Risk Poll 2019. LRF & Gallup (2022). The Lloyd's Register Foundation World Risk Poll 2021.
Additional information	
Related technical documents	Axis 2 Methods Document Axis 2 Definition Document LRF & Gallup (2020). The Lloyd's Register Foundation World Risk Poll 2019 Methodology. Available at: https://wrp.lrfoundation.org.uk/data-resources/