Climate Change Communication Efforts and Results in Latin America and the Caribbean

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Contents

Abstract

Climate change communication (CCC) is a key aspect of the United Nations' Action for Climate Empowerment (ACE) guidelines (UNESCO and UNFCCC, Action for Climate Empowerment: Guidelines for accelerating solutions through education, training and public awareness. UNESCO Publishing, 2016). CCC,

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which consists of public awareness, public participation, and public access to information, is expected to ensure that citizens are informed about climate challenges and risks, while fostering climate action and resilience. During the past decade, policy interest and academic research in CCC have increased, although most studies have been focusing on Global North contexts.

The lack of internationally comparable data around CCC, especially in the Global South, weakens policy advocacy, undermines national and regional target-setting, and impedes monitoring processes. While the prevalence, uneven quality, and lack of comparability of relevant data are salient issues in many regions, they are especially acute in Latin America and the Caribbean (LAC) (Eise et al., Climate change communication research: a systematic review. SSRN Electron J, 2020).

In this chapter, findings from a systematic exploration of data availability and quality regarding public awareness, public participation, and public access to information regarding climate change among countries in the LAC region are reported. More than 80 relevant datasets have been reviewed, most of which are complete, although some are still in process. A small set of the most promising data sources based on the following four criteria have been reviewed:

1. Validity: data collection has been peer-reviewed and, in the case of a survey, refers to a nationally representative sample.
2. Temporal coverage: data refers to at least two points in time within 2015–2030.
3. Accessibility: disaggregated data is open and free to access.
4. Geographical coverage: the data covers at least 50% of the 197 UNFCCC members and at least 1 LAC country

(Much of the analytical strategy employed in this chapter draws from a larger and more comprehensive study, known as the Monitoring and Evaluating Climate Communication and Education (MECCE) project (mecce.ca). MECCE is a 6-year partnership grant with core funding from the Social Sciences and Humanities Research Council of Canada and under the direction of Professor Marcia McKenzie from the University of Saskatchewan and the University of Melbourne. While the reported analyses are aligned with several MECCE project objectives, they do not represent an official outcome of the MECCE project).

Overall, this chapter highlights major data gaps in climate change communication in Latin America and the Caribbean regions. Identifiable inequalities are pointed out. Policy implications are highlighted especially if urgent steps are not taken by national and regional authorities to remedy the current situation.

Keywords

Climate change communication · Systematic review · Data availability · Dataset · Action for Climate Empowerment or ACE · Latin America · LAC · Public opinion · Inputs · Outputs · Outcomes · Monitoring and evaluation · Cognitive ·

Social/emotional · Public awareness · Public participation · Public access to information

Introduction

Planet Earth is undergoing significant changes due to the increase in greenhouse gas emissions (Nolan et al. 2018). The effects of climate change, which include more frequent extreme weather events such as heatwaves and storms, are already apparent in every continent and impact not only human beings but also natural ecosystems (AAAS 2014). Climate change is clearly undermining the long historical equilibrium between human societies and the natural environment (Pecl et al. 2017).

Not surprisingly, research interest in climate-related topics has increased in scientific and environmental fields, including social science fields like communication. In communication research, the term "climate change" has been the most popular keyword in recent years (Comfort and Park 2018). Notably, within the growing subfield of climate change communication (CCC), the three most popular research topics are public knowledge of climate change, public belief in climate change, and public action regarding climate change (Eise et al. 2020).

However, recent studies and reviews of CCC have mostly focused on Global North settings (Koteyko and Atanasova 2016; Su et al. 2017; Eise et al. 2020), suggesting that Africa, the Middle East, and Latin American and the Caribbean (LAC) are regions most in need of further research. Overall, research has indicated that citizens in LAC are considerably more concerned about climate change than those of other world regions. Over 80% of citizens in LAC are aware that climate change is a serious threat versus less than 50% in other regions of the world (Lee et al. 2015).

In this chapter, we explored this apparently weak scholarly focus of CCC in LAC, especially regarding data availability for monitoring and evaluation purposes. Considering the interest in and impact of climate change in the region and the current intergovernmental processes to address these issues, academia can and should contribute to policy formation through transparent and accessible information about the best approaches for capturing the status of CCC efforts and results.

This chapter also assesses the current availability of multicountry datasets to support monitoring, reporting, and evaluation strategies of CCC in the LAC region. Datasets were organized according to the three elements of the UN Framework Convention on Climate Change (UNFCCC) Action for Climate Empowerment (ACE) framework – namely, public awareness, public participation, and public access to information.

This chapter begins by briefly reviewing relevant literature pertaining to CCC both from a global and LAC perspectives. Then, it discusses the methods used to examine CCC data availability in the LAC region. The main section reports the quantity and quality of available data, identifies existing gaps in data coverage and data variety in LAC, and, finally, considers key implications from these findings.

Data Availability Regarding CCC Efforts

This section introduces the study of CCC in the past 40 years, the methods used when researching CCC efforts and results, examples of CCC measures and the institutions leading the studies, as well as the significant geographical inequalities in the study of CCC. In addition, it notes the working definitions of ACE elements and discusses their broader relevance.

The Study of Climate Change Communication

Climate change communication has been studied since the 1980s, first within the field of psychology and, later on, 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, there was rising awareness about climate change, which then turned into concerns in the early 2000s, triggering social polarization and skepticism in the 2010s.

It is worth noting that most public communication about climate change happens either through traditional media outlets or online. Journalists and editors are therefore considered the gatekeepers of an evolving CCC discourse in terms of the approaches discussed, frames used, key actors, and a diversity of interpretations (Post 2017).

Review of CCC Research Methods in Literature

Several methodological strategies have been used to study CCC. These include case studies, surveys, manual and automated content analyses, discourse analysis, visual research, and multi-method approaches. Discussions around climate change adaptation and mitigation are subject to power struggles between different social groups and worldviews (Burke et al. 2015). For instance, landowners and indigenous communities often hold opposing perspectives regarding land use. The coexistence and competition of opposing or contradictory discourses involving climate change influence public opinion and policy formation. The media is one of the main arenas where these discursive battles occur (Koteyko and Atanasova 2016).

Studies based on content analysis tend to focus on topics such as climate change coverage by the media across countries, developments over time, and how climate change is depicted either in text or images (Metag 2017). The analysis of media sources for climate-related content can either be automated or manual. Automated analyses follow a two-step procedure in which the coding software is prepared by human coders and then applied to large amounts of text or audiovisual corpora (Metag 2017). For example, these include print media, television news broadcasts, or online media. Dictionary approaches and text mining represent common strategies in automated content analysis. Manual content analysis involves trained coders who carefully read the texts to determine the prevalence and meaning of terms and

phrases. Each kind of content analysis can involve manifest or latent coding. Manifest content analysis codes explicit, categorical, and observable content (Holsti 1969; Riffe et al. 2005), while latent content analysis requires an in-depth analysis of nuances found in the texts (Post 2017). Several scholars prefer manual over automated coding, in order to better extrapolate nuances in the texts (Krippendorff 2012; Sjøvaag and Stavelin 2012). However, the advent of more sophisticated software may alter this preference going forward.

The three most prevalent analytical techniques are narrative analysis, framing analysis, and frequency analysis (Metag 2017). In narrative analysis, the focus is on the structure of texts where interpretative paradigms are followed (Wozniak et al. 2015). Framing analysis explores what perspectives or features of climate change are presented and prevail, whereas frequency analysis attempts to count the number of news items or keywords over specific periods of time (e.g., Asplund et al. 2013).

When conducting critical discourse analysis, key terms are identified, and either their appearance is analyzed (Hammerstad and Boas 2015) or metaphor maps are drafted (Ison et al. 2015). These evaluations aim at unraveling new storylines and their advocates (Zannakis 2015; Metag 2017). Context is a fundamental aspect of this type of analysis, particularly the "cognitive, social, historic, and cultural contexts" (Urquijo Reguera et al. 2015: 279), as well as issues regarding tone and language (Boykoff 2008). Discourse analysis can be subdivided into two strands: "Foucauldian" discourse analysis, which pays special attention to social issues, and critical discourse analysis (CDA), which focuses on in-depth text analysis from a linguistic perspective (Fairclough 2003).

Visual environmental communication research seeks to empirically explore how visual images convey messages about the environment (Hansen 2017). Some studies analyze how climate change is both verbally and visually communicated, while others claim that the visual component is "a critical but frequently under-estimated contributor to the social and cultural life of environmental issues" (Di Francesco and Young 2011: 157). Studies find that NGOs and journalists have similar conceptions of which images are powerful. By contrast, there were "no substantial similarities in visual frame conceptions" between journalists and representatives of government delegations (Wozniak et al. 2017: 13). Studies indicate that NGOs are significantly more successful than governments in advancing evocative visual concepts in the media, whereas the opposite occurs with spoken or written text (Hansen 2017). This implies that the selection of visual components by NGOs is better aligned with the values or desired effect of organizations (Hansen 2017).

The growing predominance of the Internet as a means of communication has led to the development of new research methods that analyze how climate change is communicated. For instance, these methods have been utilized to assess blogs (Elgesem et al. 2015). To determine journalistic decisions, a popular analytic method combines content analysis of official documents and news outlets (Post 2017). Some studies use different algorithms to capture terms like "climate change" or "global warming" on Twitter to determine whether people tend to connect extreme temperature events to climate change (Kirilenko et al. 2015; Fløttum 2017).

Also, survey research is employed to keep track of global concerns about climate change (Nisbet and Myers 2007). Large-scale survey research has shown that over 80% of citizens in Latin America and Africa are concerned about climate change (Lee et al. 2015), a figure significantly higher than in other world regions. Some surveys incorporate open-ended questions such as "What comes to mind when you hear or read the words 'climate change'?" Answers to these and similar questions add nuance to the public discourse through a detailed linguistic analysis (Fløttum 2017).

Geographical Coverage and Regional Differences

CCC research has mainly focused on Global North contexts, especially in North America and Europe (Schäfer and Schlichting 2014). For example, 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). Significant content analyses of CCC are also found in several high-income, European countries (Metag 2017). Studies report that 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).

A recent comprehensive analysis of CCC research found that out of 255 studies, 176 use data from Europe and North America and 81 from the rest of the world (Eise et al. 2020). Few studies draw on information from Africa, Latin America and the Caribbean, and the Middle East (Eise et al. 2020). Inequalities in Internet access may account in part for the limited research of CCC in the Global South. That said, given that many Global South countries and communities are hardest hit by climate change, the dearth of studies focusing on these settings is a major limitation of the existing CCC literature.

Action for Climate Empowerment

Action for Climate Empowerment (ACE) is a term adopted by the United Nations Framework Convention on Climate Change (UNFCCC) to denote work under Article 6 of the Convention (1992) and Article 12 of the Paris Agreement (2015). The overarching goal of ACE is to empower all members of society to engage in climate action, through education, training, public awareness, public participation, public access to information, and international cooperation on these issues. This chapter focused on three ACE elements – namely, public awareness, public access to information, and public participation – within broader UNFCCC contexts. It was beyond the scope of this chapter to discuss education, training, and international cooperation.

Public awareness can be understood as outreach programs or activities that employ targeted, systematic communications to the public (UNESCO and UNFCCC 2016). This type of activity may be developed by governments, NGOs,

intergovernmental organizations, or other entities. Public access to information is defined as programs or activities that make information, data, and statistics available to the public. Technologies such as databases and the Internet, often including accessibility in multiple languages, help to facilitate this provision of information. Public participation refers to the efforts to mobilize the public in climate mitigation and adaptation activities and to integrate public perspectives in policy decision-making, community action, or policy advocacy (UNESCO and UNFCCC 2016).

The UNFCCC (1992) defines climate change communication (CCC) as communication and public engagement efforts aimed at educating and informing the national public, or specific audiences, about climate change and its impacts to mobilize action to address it through mitigation, adaptation, impact reduction, and early warning. The term CCC encompasses the three ACE elements noted above: public awareness, public participation, and public access to information.

Effective climate communication would be expected to go beyond the simple transfer of information on climate science and the like and include additional learning dimensions – specifically, social and emotional, on the one hand, and behavioral and action-oriented, on the other hand. Integrating cognitive, social and emotional, and action approaches in a holistic fashion in the three ACE elements would result in the strongest outcomes. Cognitive approaches enable learners to develop knowledge of climate change, including its underlying anthropogenic and biophysical causes, impacts, and potential solutions. Social and emotional approaches highlight emotions, feelings, and dispositions toward climate change and its impacts. In practice, this means creating learning experiences that enable learners to collaborate more effectively, negotiate, and communicate with others to address climate change challenges. For example, this would include self-reflection skills, values, attitudes, and motivations that enable people to build their own capacity for resilience in the face of climate change and its impacts. Lastly, action or behavioral approaches seek to develop action competencies, including skills and practices, individual and collective agency, and behavioral change to address climate change and to minimize one's own and collective climate impact (UNESCO and UNFCCC 2016).

Scoping CCC in LAC

This scoping exercise consisted of two steps: first, searching for multicountry datasets related to CCC and, second, selecting the most relevant for monitoring and evaluation purposes based on multiple criteria (e.g., geographical scope, temporal scope, accessibility, and validity). The search was conducted between June 2021 and January 2022 through the Google search engine. Given the wide scope of this endeavor, several experts were initially consulted to provide a list of relevant data sources (i.e., institutional websites, data repositories, and relevant academic papers), from which to start the search. The search terms considered each ACE element accompanied by "climate change" or "global warming." Terms regarding data types such as "survey," "poll," "time series," and "database" were also applied.

The initial inclusion criteria considered existing multicountry (minimum five countries) datasets with at least national-level measures regarding climate change, public awareness, public participation, or public access to information. This search yielded 43 datasets. In this work however, 1 additional criterion was added: the dataset had to include data for at least 1 LAC country, which resulted in a total of 32 datasets.

The selected 32 datasets were classified according to their validity, temporal scope, accessibility, geographical coverage, measurement level, associated dimension (cognitive, social/emotional, action/behavioral), and subject focus (climate change vs. general environmental issues). The first four criteria are further described under "quality index."

Measures in the datasets were further classified by "measurement levels," which referred to (1) inputs, regarding the strength of national legal and institutional frameworks surrounding CCC (e.g., policy documents, funding, strategic plans, commitments); (2) outputs, concerning the level of implementation of CCC policies or strategies; and (3) outcomes, focusing on CC public knowledge, skills, perceptions, attitudes, and behaviors such as objective and perceived knowledge, CC risk awareness, emotional concern, interest in cooperating, trust in information, satisfaction with national efforts, personal adoption of behaviors, and participation in collective action.

Quality Index

To assess the extent to which available datasets can be used for monitoring and evaluating CCC inputs, outputs, and outcomes, an index of data quality for monitoring and evaluation purposes (hereafter referred to as "quality index") was developed. This quality index (QI) does not represent a general data quality assessment, but rather an assessment of the potential use of existing data for monitoring and evaluation purposes. Hence, the "best" datasets under this assessment were those that fulfil the aforementioned criteria for "credible and actionable evidence" (Donaldson 2015).

The QI combined the weighted scores assigned to each dataset in terms of validity, temporal scope, accessibility, and geographical coverage. Table 1 illustrates the rubric used to assign scores in a three-point scale. The scores were weighted to reflect the importance of each criterion for CCC monitoring purposes. Validity was given considerable weight, following the long-standing academic discussions around the centrality of internal and external validity for social research and evaluation objectives (Cronbach and Meehl 1955; Crooks et al. 1996; Garaway 1997; Newton and Shaw 2016). To facilitate comparisons and visualization, QI values were normalized, transforming original data points to a scale ranging from 0 to 1. Each dataset was assigned a value for each of the criteria and an overall value.

The quality index was used along the LAC geographical coverage in four-quadrant matrices to assess datasets for monitoring and evaluation purposes in the LAC region. Additionally, data availability maps were constructed to support the assessment of the national availability of datasets in each of the LAC countries

Table 1 Criteria considered for the data quality index

Criteria	Good (=3)	Fair (=2)	Poor (=1)	Weight	Max. score
Validity	Adequate data collection process, peer-reviewed data and analyses, representative of either national population or age subgroup	Adequate data collection process, peer-reviewed data or analyses, lower external validity	Data collection process is subject to high risk of bias	70%	2.1
Temporal scope	Recurrent: data collection conducted more than twice in the 2015–2030 period	Recurrent: data collection conducted twice in the 2015–2030 period	One-off data collection	20%	0.6
Accessibility	Respondent-level dataset open and free	Access to aggregated data only or respondent-level dataset upon request	Access only through payment	5%	0.15
Geographical coverage	Covers 98 or more countries – 50% of 197 UNFCCC countries	Covers 49 or more countries – 25% of 197 UNFCCC countries	Covers less than 49 countries	5%	0.15
Total				100%	3

Source: authors' elaboration

according to ACE element and measurement level. The four-quadrant matrices were developed in Microsoft Excel, and the choropleth maps were generated using Datawrapper.

As previously mentioned, the scoping exercise focused on 32 multicountry datasets with national-level data for at least 1 LAC country and at least 1 ACE element. Most datasets referred to 1 aspect of public awareness (22 out of 32 or 69%) or public participation (53%); fewer referred to public access to information (19%). Over a third of the datasets were classified as useful for more than one ACE element, as illustrated in Fig. 1.

Of the 32 datasets, 12 were judged to be of sufficient quality and geographical coverage for monitoring purposes of CCC efforts and results in the LAC region. Figures 2, 3, and 4 describe the classification and selection processes undertaken to reach this result. First, for each ACE element, the datasets were plotted according to their quality index and LAC coverage. Following this step, all datasets located in quadrant I – top right corner – were considered for the selection set. Additionally, datasets from quadrant II (top left corner) which have a high relative validity ($\geq$0.75) and covered at least 25% LAC countries were included.

The resulting selection referred to as "M&E selection" was composed of the 12 datasets (Table 2). Most of these (40%) were related to communication outcomes

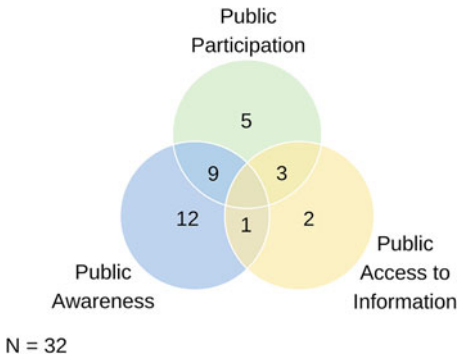

Fig. 1 Number of datasets identified per ACE element. (Source: authors' elaboration)

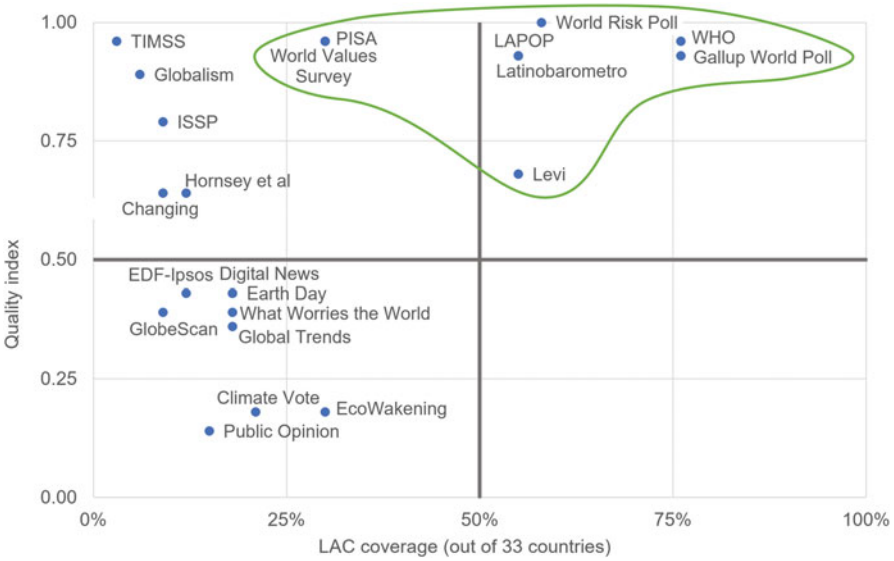

Fig. 2 Public awareness datasets per LAC coverage and quality index. (Source: authors' elaboration)

such as the understanding of climate change as a serious problem or the participation in environmental organizations. Only one-quarter of the 12 datasets depicted outputs such as the quantity of climate change-related news articles or perceptions regarding government efforts to protect the environment. Another quarter of the datasets related to inputs such as financial aid allocated to climate communication efforts or national commitments toward any of the three ACE elements. Table 2 summarizes key information about each dataset.

In reference to the three learning dimensions (cognitive, social-emotional, and action), 11 of the 12 datasets (92%) contained an explicit cognitive dimension such as efforts to increase knowledge of climate change; 42% of the datasets contained

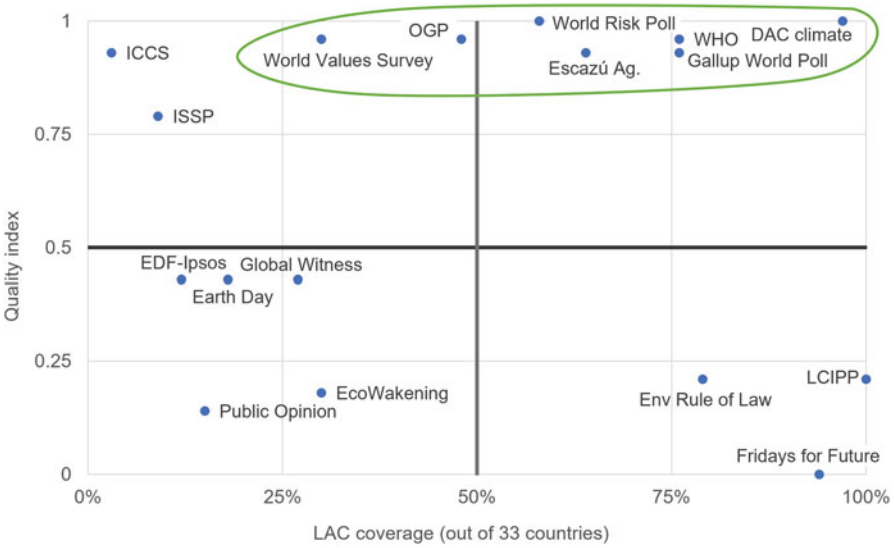

Fig. 3 Public participation datasets per LAC coverage and quality index. (Source: authors' elaboration)

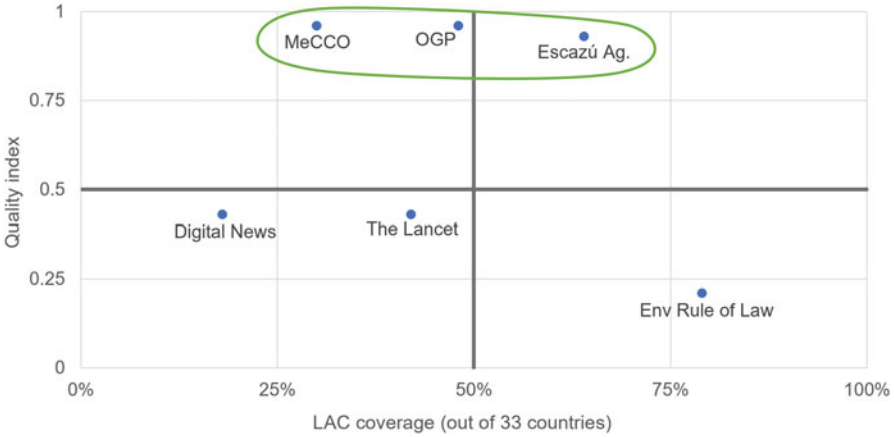

Fig. 4 Public access to information datasets per LAC coverage and quality index. (Source: authors' elaboration)

information relevant to a social-emotional dimension, such as the expression of feelings and motivations related to climate causes, effects, and actions. A similar percentage of datasets (41%) referred to an action or behavioral aspect related to CCC, such as citizen participation in assemblies around climate change mitigation, or adaptation decisions.

Table 2 "M&E selected" datasets

Dataset ID	Dataset name	Description	Period [rounds collected]	Next data	Measure. level	Learning dimension	Subject focus	ACE element
DAC climate	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	2000–2019 [20]	2022	Input	Cognitive, action	Climate change	Public participation
Escazú Ag.	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 World Poll	Gallup survey that polls representative samples of households in a large sample of countries (150+). Eligible participants are aged 15 and above	2005–2021 [15]	2022	Output	Cognitive	Environ. issues	Public awareness, public participation
LAPOP	LAPOP Americas Barometer	Vanderbilt University periodic study of 34 countries in the Western Hemisphere. It measures attitudes, evaluations, experiences, and behavior in voting age adults in the Americas	2004–2021 [8]	2022	Outcome	Cognitive	Climate change	Public awareness

Latinobarometro	Latinobarometro	Annual public opinion survey in 18 LAC countries, with nationally representative samples of the population aged 18 and above	1995–2020 [21]	2022	Outcome	Cognitive, social-emotional	Climate change	Public awareness
Levi	Levi (2021)	Study "Country-level conditions like prosperity, democracy, and regulatory culture predict individual climate change belief"; it analyzes the belief in human-made climate change in population aged 18 and above, in 2007–2010 (Gallup data) and 2016–2019 (60 countries, data from 6 different surveys)	2016–2019 [1]	–	Outcome	Cognitive	Climate change	Public awareness
MeCCO	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 7 different regions of the world	2004–2021 [57]	2022	Output	Cognitive	Climate change	Access to information

(continued)

Table 2 (continued)

Dataset ID	Dataset name	Description	Period [rounds collected]	Next data	Measure. level	Learning dimension	Subject focus	ACE element
OGP	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
PISA	Programme for International Student Assessment	Recurrent assessment instrument 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	Climate change	Public awareness
WHO	WHO Health and Climate Change country survey	Conducted every 3 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	2017–2021 [2]	2023	Output	Cognitive, social-emotional, action	Climate change	Public awareness, public participation
World Risk Poll	The Lloyd's Register	Implemented by Gallup, this survey targets nationally representative	2019–2021 [2]	2023	Outcome	Cognitive, social-emotional	Climate change (P.A.) and	Public awareness,

	Foundation (LRF) World Risk Poll	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)					environ. Issues (P.P.)	public participation
World Values Survey	World Values Survey	International research program devoted to the study of social, political, economic, religious, and cultural values of people. The recurrent multicountry survey targets people aged 18 and above	1981–2020 [7]	2022	Outcome	Cognitive, social-emotional, action	Environ. issues	Public awareness, public participation

Source: authors' elaboration

Regarding the subject focus, 9 of the 12 datasets (75%) made explicit use of the term "climate change" in their survey items or scales; only 3 datasets – namely, World Values Survey, Gallup World Poll, and Escazú Agreement – took a wider approach, addressing environmental issues or environmental activism. It is worth noting that during the search phase, these three datasets were identified in academic papers as having an explicit climate change element and, thus, were included in the initial identification of CCC datasets. In fact, the items were used as proxies for CCC matters.

To assess the monitoring potential of the 12 datasets, the frequency of data collection points was considered. Ninety percent of the selected datasets qualified as pseudo-panel data, since they recorded nationally representative values, at a minimum of two time points during the 2015–2030 period, with the exception of the Levi (2021) study, which was cross-sectional. Half of the 12 datasets were committed to updating national values on an annual basis.

Six of the 12 datasets were classified as useful for more than 1 ACE element (see last column of Table 2). Out of the eight public awareness datasets, four were also relevant for public participation, whereas out of the seven public participation datasets, two were also relevant for public access to information.

Figure 5 summarizes the number of datasets available per ACE element for each LAC country. Argentina, Brazil, Colombia, and Peru were included in all datasets that contain a public awareness, public participation, and public access to information element. Countries in the Caribbean had the least available information on the three ACE elements, except for the Dominican Republic, which was among the upper half of countries regarding data availability.

Public participation was the most prominent ACE element, covered in at least one dataset in every country, while public awareness was covered in all but two countries. Public access to information was the least prominent element and was absent in several countries in the Caribbean.

Figure 6 mapped data availability regarding the 12 selected datasets according to ACE element and measurement level (inputs, outputs, and outcomes). The choropleth graph presents nine maps with countries colored according to dataset availability. The dark blue color refers to when there were at least two datasets concerning a specific intersection of ACE element and measurement level, light blue when there was one dataset at such an intersection, and orange when there was no available dataset. The main gaps found were regarding input measures of public awareness (e.g., policy documents, funding, strategic plans, commitments) and outcome measures of public access to information (e.g., climate change information access and use from the user perspective). Output data on public participation (e.g., implementation of participatory processes for climate decisions and action) and public access to information (e.g., implementation of access to information strategies) was also scarce.

The following five intersections had the greatest data availability:

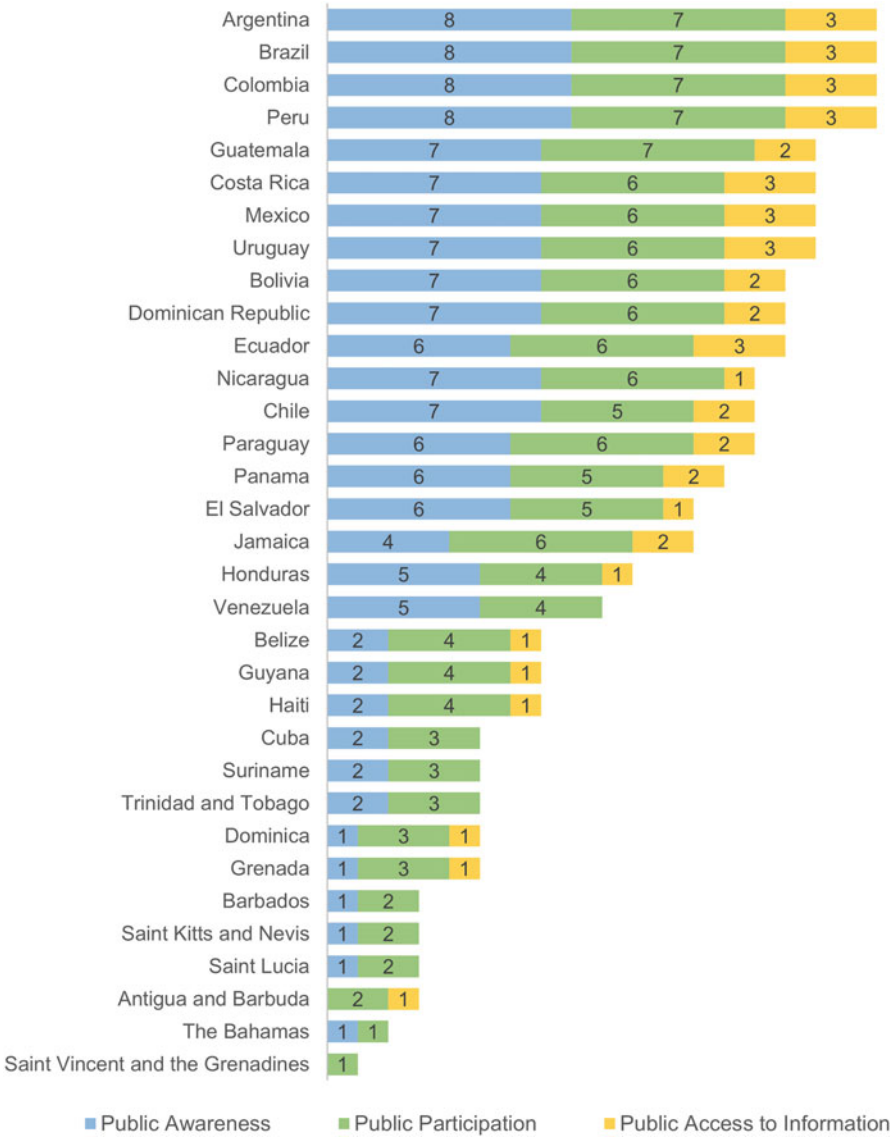

Fig. 5 Number of "M&E selected" datasets available per ACE element for each LAC country. Please note that some datasets account for more than one ACE element. (Source: authors' elaboration)

1. Public awareness outcomes, including data on the perception of climate change as a serious threat and general climate change knowledge from LAPOP, Latinobarometro, Levi, PISA, World Risk Poll, and World Values Survey.

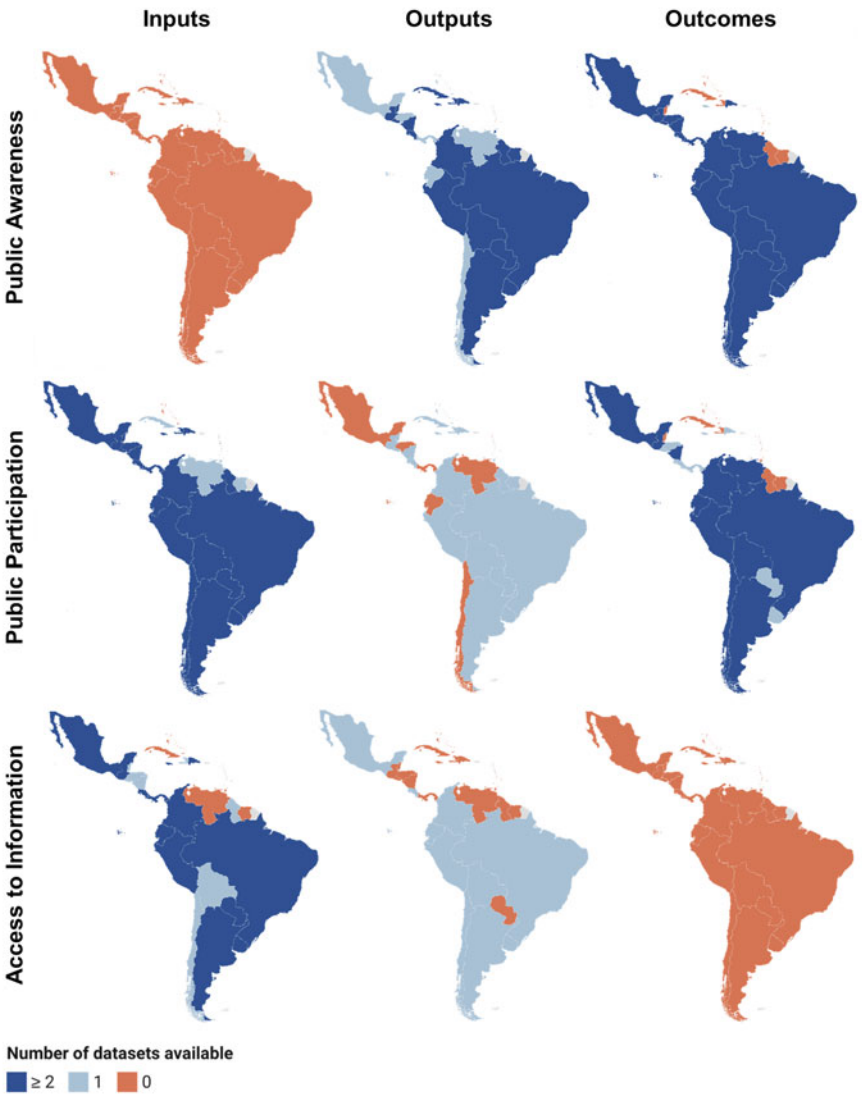

Fig. 6 LAC maps according to data availability, per ACE element and measurement level. (Source: authors' elaboration)

2. Public awareness outputs, including Gallup World Poll's data on satisfaction with government efforts to protect the environment and WHO's data on government-run climate change campaigns.

3. Public participation inputs, including climate finance data related to citizen participation from the OECD DAC database and government commitment data from the Open Government Partnership (OGP) and the Escazú Agreement.
4. Public participation outcomes, including the World Risk Poll's data on disaster preparedness and the World Values Survey data on environmental activism.
5. Public access to information inputs, again including data on government commitments from the OGP and the Escazú Agreement.

Discussion

This scoping exercise clearly showed that even though there were more than 30 datasets with CCC information on countries in LAC, only 12 datasets were assessed as sufficient for monitoring and evaluation purposes.

Datasets focused on outcomes (rather than inputs or outputs) were the most prominent and tended to cover all three learning dimensions (cognitive, social and emotional, and behavioral – action). That said, no single dataset covered all three dimensions. The most prominent dimension was the cognitive one, which aligns with findings from studies on climate change education (UNESCO 2021).

From a monitoring perspective, even though many datasets included data at more than one time point, only half of them would have been useful to monitor CCC changes on an annual basis. Given that public views of climate change appear to be shifting rather quickly, the ability to regularly track dispositional changes over time would be key to effective policy planning and implementation.

Overall, existing datasets poorly captured ACE elements for Caribbean countries and small island states. This is particularly the case in relation to public access to information. In South America, ACE-related data were more prevalent for countries like Peru, Argentina, Brazil, and Colombia as compared to Venezuela, Guyana, and Suriname. Interestingly, these data gaps did not respond to differences in population or population density, since countries like Haiti and Cuba were also included in few datasets, whereas a low population country like Uruguay was included in 10 out of the 12 datasets. Few databases focused on inputs for public awareness and outcomes for public access to information.

Limitations

This exercise entails several limitations. First, the validity of specific items within each dataset was not analyzed. This would be a necessary step before utilizing specific items in the datasets. Second, only datasets with national data were included in the exercise. This excludes some relevant datasets that report aggregated regional data in LAC such as UNICEF's "Esfuércese más" study or the climate change survey carried out by Statsknow. Finally, the work presented here would be difficult to replicate since the starting point was expert input on datasets from which additional datasets were identified as part of a snowball-like sample.

Conclusion and Recommendations

This chapter explored data availability and quality regarding three ACE elements within climate change communication among countries in the LAC region. From an initial sample of 80 datasets, 32 multicountry datasets were identified with national-level data for at least 1 LAC country and addressing at least 1 of 3 ACE elements of interest – public awareness, public participation, and public access to information. Then, using a composite index of dataset quality, a final sample of 12 datasets was selected for further analysis.

This scoping exercise has clearly shown that, despite the availability of considerable information regarding climate change communication in the LAC region, in most cases the data are of insufficient quality for monitoring and evaluation purposes. In addition, clear evidence of data gaps and inequalities within the LAC region was uncovered. Higher-income LAC countries – for example, Argentina, Brazil, and Peru – had more and better-quality CCC data than other countries within the region. There is a dearth of datasets with relevant information on Caribbean countries, even though the effects of climate change are quickly spiraling out of control for many small island nations.

Overall, more quality and holistic data on CCC is sorely needed in the region. This emerged as a major finding of this scoping exercise. This is especially notable in reference to data on CCC inputs and outputs. Given the plethora of methods being used to track CCC in other world regions, LAC decision-makers should take note of existing innovative methodological approaches to improve the quantity and quality of CCC data. A crucial element is data objectivity, and therefore, more "objective" measurements or subsequent external data verification steps should be given preference in future studies.

While the need for improvements in the quantity and quality of CCC data for monitoring purposes can be found in many regions, this chapter focused on the status of data availability in the LAC region and highlighted major data gaps, especially between high- and low-income countries. Even though the carbon footprint of low-income and small island countries is modest, the effects of climate change loom large and underscore the importance of innovative interventions and initiatives, whose impact is carefully tracked, when using robust data sources. National authorities and development partners should prioritize funds for climate-related data collection at both the national and regional levels.

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