



Climate justice, how and where it is studied: a decade-long systematic review

Justiça climática, como e onde é estudada: revisão sistemática de uma década

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ABSTRACT: This Systematic Literature Review (SLR) aimed to identify the different *qualitative* methodologies used for academic research in the context of *climate justice*. The inclusion criteria encompass studies fully available in the selected scientific bases, published in peer-reviewed journals, that explored *climate justice* themes using *qualitative* or mixed methodology, over the last 10 years (2014-2023). The exclusion criteria were studies unavailable online, duplicates and research that had the words in the title and/or keywords and/or abstract, but the topic was marginal in the article, studies with more than 10 years of publication. Using the Web of Science, Scopus and SciELO database, 34 studies were identified, which were last searched in January 2024. The SLR addressed central questions, research methods and subjects involved and revealed a diversity of approaches and perspectives in the field of *climate justice*. The studies examined highlighted the interconnection between social, environmental and climate issues, emphasizing the need for an integrated analysis to truly understand the challenges faced. The variety of research methods used underlines the complexity of the dynamics involved in the search for equitable solutions. The research spanned a diverse range of contexts, from local communities to global initiatives, reflecting the urgency and breadth of climate issues. This SLR faced limitations, including the impossibility of conducting the traditional collaborative process of a systematic review, the exclusion of gray literature due to time and access restrictions, and the focus on quantitative methodologies, revealing challenges in indexing *qualitative research* in online databases. The main source of funding for the review was the authors themselves. This study offers preliminary insights into the state of knowledge and what *qualitative* methodologies are being used to research *climate justice*.

Keywords: climate justice; qualitative methodologies; Global North and South; Systematic Literature Review.

RESUMO:

Esta Revisão Sistemática da Literatura (RSL) teve como objetivo identificar na literatura as diversas metodologias qualitativas utilizadas para a pesquisa no contexto da justiça climática. Os critérios de inclusão englobam estudos integralmente disponíveis nas bases científicas selecionadas, publicados em periódicos revisados por pares, que exploraram os temas de justiça climática utilizando metodologia qualitativa ou mistas, no período dos últimos 10 anos (2014-2023). Já os critérios de exclusão foram estudos indisponíveis *online*, duplicados e pesquisas que possuíam as palavras no título e/ou palavras-chaves e/ou resumo, porém o tema era marginal no artigo e estudos com mais de 10 anos de publicação. Foram identificados 34 estudos, utilizando as bases de dados *Web of Science*, *Scopus* e *SciELO*, pesquisado pela última vez em janeiro de 2024. A RSL abordou questões centrais, métodos de pesquisa e sujeitos envolvidos e revelou uma riqueza de abordagens e perspectivas no campo da justiça climática. Os estudos examinados destacaram a interconexão entre questões sociais, ambientais e climáticas, enfatizando a necessidade de uma análise integrada para compreender verdadeiramente os desafios enfrentados. A variedade de métodos de pesquisa utilizados evidenciou a complexidade das dinâmicas envolvidas na busca por soluções equitativas. A pesquisa abrangeu uma gama diversificada de contextos, desde comunidades locais até iniciativas globais, refletindo a urgência e a amplitude das questões climáticas. Esta revisão enfrentou limitações, incluindo a impossibilidade de conduzir o processo colaborativo tradicional de uma revisão sistemática, a exclusão de literatura cinza devido a restrições de tempo e acesso, e a foco em metodologias quantitativas, revelando desafios na indexação de pesquisas qualitativas em bancos de dados eletrônicos. A principal fonte de financiamento para a revisão foram as próprias autoras. Este estudo oferece *insights* preliminares sobre o estado do conhecimento e quais metodologias qualitativas estão sendo utilizadas para pesquisar a justiça climática.

Palavras-chave: justiça climática; metodologias qualitativas; Norte e Sul Global; Revisão Sistemática da Literatura.

1. Introduction

Climate change represents an urgent global issue. Although the devastating consequences of climate change have been known, researched, and denounced for decades, it is only relatively recently that it has become a prominent topic in *mainstream* discourse. This can be explained, in part, by the fact that the impacts of climate change are more explicit and, therefore, are being felt more acutely around the world (Agyeman *et al.*, 2016). This mainstream discourse is framed by the belief that everyone will suffer equally, but climate justice challenges this notion: the impacts of climate change actually fall disproportionately on marginalized groups.

The Climate Justice movement was directly influenced by the history and conceptualization of Environmental Justice, defined as

the set of principles that ensure that no group of people, whether ethnic, racial, or class-based, bears a disproportionate share of the adverse environmental impacts of economic activities, federal, state, and local policies and programs, as well as those resulting from the absence or omission of such policies (Herculano, 2008, p. 2).

This approach is essential, as a wide range of studies show that ethnic groups and low-income populations are disproportionately exposed to environmental risks. The interconnection between environmental and racial issues is a fundamental

aspect of the environmental justice movement, which later broadened its focus to include other social markers, such as gender and class. This movement aims to tackle environmental racism, defined as the set of environmental and social injustices that disproportionately affect vulnerable ethnic groups. This perspective highlights the importance of addressing structural inequalities that intensify negative impacts on these populations (Bullard & Wright, 2009).

Climate change has come to be understood as yet another type of environmental condition that reflects social injustices affecting poor and marginalized communities, thus laying the foundation for further exploration of climate vulnerability and justice (Schlosberg & Collins, 2014). The Climate Justice movement denounces this disproportionate burden on vulnerable communities and countries in relation to the impact of climate change and focuses on holding accountable those who have benefited and continue to benefit from greenhouse gas emissions throughout history (mostly countries and companies located in the Global North¹). The movement argues that, when considering mechanisms to combat climate change, inequalities between countries and marginalized groups must be taken into account so that we can repair these injustices with fair and equitable strategies.

In this context, climate justice calls for the inclusion of marginalized groups, commonly

regarded vulnerable, to actively participate in the discussion and search for solutions to the impacts caused by climate change (Louback, 2020). In the critical understanding adopted here, Climate Justice

[...] investigates how and why different groups of people face climate inequalities in different ways, integrating *insights from* a range of academic theories (such as feminist, anti-racist, anti-capitalist, postcolonial, decolonial), as well as *insights from* activist movements for climate justice, in order to promote the praxis of solidarity and collective action (Sultana, 2021, p. 119).

These theoretical frameworks, such as anti-racism and decolonialism, offer essential tools for unraveling the historical and structural roots of climate inequalities, revealing how legacies of colonialism, racial exploitation, and economic exclusion continue to shape who bears the brunt of climate change impacts and who defines policy responses (Louback, 2020; Mohtat & Khirfan, 2021). By illuminating how these power dynamics reinforce global and local inequalities, these perspectives challenge traditional approaches and suggest transformative solutions that prioritize justice, historical reparations, and the recognition of silenced voices in the climate debate.

To address this major challenge of climate change and achieve climate justice, a deep understanding of the issue is needed, based on

¹ The term Global North is used to refer to economically developed countries, generally located in the Northern Hemisphere. The term Global South, on the other hand, is used to refer to emerging countries and aims to replace expressions such as “Third World” and “underdeveloped”. Therefore, the South corresponds to a very heterogeneous group that includes countries with radically different degrees of political and economic projection at the international level, ranging from emerging countries such as Brazil and China to peripheral countries such as Haiti and Guinea Bissau. Caixeta (2014) emphasizes that the North-South divide does not correspond to geographical hemispheres.

comprehensive research addressing its causes, impacts, and potential solutions (Amorin-Maia *et al.*, 2022; Newell *et al.*, 2021). In fact, to date, this is still an immature field, as shown by the most recent articles in this area. Hughes and Hoffmann (2020) point out that climate justice scholars have been largely normative, theoretical, and global in their approach and that, given the urgency of the issue, there is a need to translate these studies into *design* principles, governance practices, and engagement tactics.

Mohtat and Khirfan (2021) analyzed 136 articles on urban adaptation and climate justice, concluding that there is an imminent need for future studies to develop adaptive urban design methodologies or measures aligned with the three pillars of climate justice: distributive, procedural, and recognition justice. Other articles point to the need to develop methodologies to operationalize climate justice (Chu & Cannon, 2021; Kashwan, 2021; Hess & McKane, 2021), or to develop concrete tools and metrics (Diezmartínez & Gianotti, 2022). In this sense, traditional methods of climate change research tend to be quantitative, typically focusing on numerical data such as temperature measurements, carbon dioxide levels, and climate model simulations (Peres *et al.*, 2020). Although quantitative methods provide valuable information, qualitative research methods offer a different approach that can complement and improve our understanding of climate change. In this context, qualitative research methods focus on exploring the lived experiences and stories of individuals and communities affected by climate change. By capturing personal narratives, qualitative research

allows us to gain a more holistic understanding of climate change and its effects on individuals and societies.

Qualitative research is concerned with “a reality that cannot be quantified, answering very specific questions, working with a universe of meanings, beliefs, and values that correspond to a deeper space of relationships, of phenomena that cannot be reduced to the operationalization of variables” (Spindola & Santos, 2003, p. 120). In this way, qualitative research methods allow researchers to delve deeper into the complexities of climate change by examining how it shapes people’s lives, relationships, and identities. These methods can help uncover the emotional and psychological impacts of climate change, as well as shed light on communities’ adaptation and resilience strategies. Carvalho (2019), for example, emphasizes that, in methodological terms, increasing the resilience of groups, communities, and cities requires a paradigm shift, incorporating climate scenarios into socio-environmental vulnerability studies, as well as into feasibility studies for climate adaptation projects. In this context, “the simple use of historical series of probability of occurrence no longer meets current challenges” (Carvalho, 2019, p. 239). Moreover, to manage the impacts of climate change more effectively and to support adaptation efforts, it is essential that academia, as well as public and private organizations, explore processes of social participation, learning, and the integration of diverse forms of knowledge. Consequently, they must move beyond conventional top-down approaches (Adger *et al.*, 2013). Thus, to understand which qualitative methodologies have been

used in studies on climate justice, a Systematic Literature Review (SLR) was conducted.

SLR represents research that aims to be grounded, methodical, and explicit, involving the analysis of a clearly formulated question using systematic and explicit methods to identify, select, and critically evaluate relevant research, as well as collecting and analyzing data from the studies included in the review (Moher *et al.*, 2015)². Thus, the central objective of this SLR was to examine, in the academic field, qualitative studies on climate justice, assessing where and how climate justice is conceptualized, operationalized, and analyzed.

This SLR sought to answer the following questions: What are the central issues explored in studies on climate justice, and how are they outlined? What methodological methods and procedures were used to investigate this topic? In addition, we sought to identify the subjects who were listened to in qualitative research on climate justice, outlining their demographic and contextual profiles. The analysis also extended to the temporality and context of the research, with the aim of mapping the years in which the studies were conducted and the specific contexts in which they were carried out. Thus, this systematic review sought to present an academic overview, providing a comprehensive view of the current state of research on climate justice, with an emphasis on qualitative methodologies.

2. Methodological procedures

This SLR followed the recommendations of Higgins *et al.* (2023) adopting characteristics present in studies of this nature: a set of previously established objectives, clearly outlined with eligibility criteria; an explicit and reproducible methodology; a systematic search aimed at identifying all studies that meet the eligibility criteria; an assessment of the validity of the results of the included studies; and a systematic presentation and synthesis of the characteristics and findings of the incorporated studies.

Given these premises, qualitative methodologies used in climate justice research can be systematically mapped in order to understand the current *status* of this topic in academia. The systematic review was conducted using the *Covidence* platform, adhering to the PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) guidelines³ in accordance with Moher *et al.* (2015) e Shamseer *et al.* (2015). The use of PRISMA aimed to facilitate the understanding, evaluation, and replication of studies, contributing to the reliability and usefulness of the evidence presented in the scientific literature (Page *et al.*, 2021a, 2021b). The PRISMA statement checklist⁴ for this SLR is available in Supplementary Material 1. The processes carried out at SLR are shown in Figure 1 and detailed below.

² Systematic literature reviews originated in the field of health and medicine and, later, were adopted in several other disciplines, such as engineering and social sciences.

³ The PRISMA *Statement* is a guideline developed to improve the quality of the preparation and presentation of systematic reviews and meta-analyses.

⁴ The PRISMA statement (2020) was designed primarily for systematic reviews of studies that assess the effects of health interventions, regardless of the design of the included studies (Page, 2021b). However, the items on the checklist are applicable to reports of systematic reviews that evaluate other non-health-related interventions, including quantitative research.



FIGURE 1 – Steps taken in this SLR process.
SOURCE: The authors.

2.1. Identification of the research question

Well-formulated review questions enhance scientific rigor by employing a structured format. Breaking down the question into separate components not only makes it easier to formulate an answerable question, but also helps in developing an effective search strategy. The PICo model was used: *Population, Interest, Context* (Cooke *et al.*, 2012) to guide the formulation of research questions, as specified in Table 1.

Thus, the overall objective of the review was outlined as “to identify in the literature the various qualitative methodologies used for research in the context of climate justice,” and the following research question was established: “What are the qualitative methodologies used in academic research on climate justice?”

It is important to note that a deliberate decision was made not to incorporate the term “environmental justice” into this review. This decision reflects a methodological choice based

on conceptual distinctions, as well as the search for focus and specificity in the topic addressed. Climate justice stems from the concepts of environmental justice, but although they share elements, they have significant conceptual distinctions. Climate justice can be understood as a branch or area of specialization within environmental justice, emphasizing a fundamental social justice issue related to climate change (Cavalcanti *et al.*, 2022). While climate justice focuses predominantly on the specific impacts of climate change on communities, ecosystems, and societies, environmental justice encompasses a broader range of issues, including, for example, the impact of a landfill being located near a community. Thus, the term “environmental justice” can encompass a variety of contexts and environmental problems, resulting in a wide range of results in the literature search. The breadth of the term “environmental justice” could therefore potentially dilute the scope of the research, hindering detailed critical analysis. Limiting the

TABLE 1 – Description of the incorporation of the PICo model in this study.

PICo model items	Description
Population	Qualitative methodologies used on climate justice
Interest	What types of qualitative research approaches are used in climate justice research?
Background	What subjects or objects were analyzed in the research?

SOURCE: The authors.

review to “climate justice” provides a more specific focus, allowing for a more in-depth and coherent analysis of studies relevant to the topic of climate justice.

2.2. Development of the SLR protocol

A protocol was developed for this SLR and is available in Supplementary Material 2. The systematic review protocol clarified the rationale, hypothesis, and planned methodologies in this SLR. The SLR protocol played important roles, as highlighted by Shamseer *et al.* (2015): the definition of clear objectives; the implementation and evaluation of the review process; and the analysis of the success of both the process and the results obtained. In addition, this protocol may contribute to reducing the efforts of other researchers, enabling them to verify the quality of the review previously performed or to continue the research already carried out.

The protocol allowed us to outline the inclusion criteria, encompassing studies that are fully available in selected scientific databases, published in peer-reviewed journals, and that explored climate justice issues using qualitative or mixed methodologies over the last 10 years (2014–2023). Exclusion criteria were also defined, eliminating:

a) studies not available *online*,

b) duplicate studies and research in which, despite having the words in the title and/or keywords and/or abstract, the theme of Climate Justice and qualitative methodologies were marginal in the article; and

c) studies published more than 10 years ago. In addition, works published solely as posters were excluded.

2.3. Search for studies in selected databases

The criteria for defining the databases included the availability of articles in English, Portuguese, or Spanish, and the ability to standardize the search *string* in the electronic databases indexed, selected for the study. The following databases were selected: *Web of Science*, *Scopus*, and *SciELO*. All are reputable sources providing peer-reviewed academic information (Page *et al.*, 2021a). The selection of these databases is based on their comprehensive coverage of literature in various disciplines, enabling us to obtain relevant academic data on the topic of interest from trusted researchers and experts.

When developing the search strategy, it was observed that the combination of “*climate justice*” and “*qualitative research*” significantly restricted the search results, leading to the decision to adjust the keywords to “*climate justice*” and “*qualitative*” for a more comprehensive result. However, after applying the *string* to the three selected databases, no articles originating in Brazil were found. Given the nature of this research, conducted in the Brazilian context, the authors expressed a particular interest in understanding the approach to climate justice research in Brazil and Latin America as a whole. Thus, it was determined that, for the *SciELO* database, which provides access to academic literature in Science, Social Sciences, Arts, and Humanities published in the main open-access journals

in Latin America, Portugal, Spain, and South Africa, a new search would be conducted using only the keyword “climate justice.” This strategy proved successful, and therefore a double search was conducted in *SciELO*, focusing exclusively on abstracts, to capitalize on its effectiveness in highlighting crucial results and conclusions from the studies, which allowed for the rapid identification of works of significant relevance and impact for the review in question. Thus, specific *strings* were used for each database, as shown in Table 2.

2.4. Selection of studies for SLR

A single researcher conducted the study selection process. For the selection of studies, searches were conducted using keywords in the selected databases, last searched in January 2024, with the results subsequently imported into the *Covidence* platform for analysis. The initial process involves removing duplicate studies, which is done automatically by the platform and then checked manually by the researcher to ensure that duplicates are identified accurately and correctly.

For the selection of studies, an initial analysis of titles and abstracts was carried out, applying predefined inclusion and exclusion criteria. This primary screening phase enabled a more targeted selection of studies to be considered in the systematic review. Next, a more in-depth reading was carried out, covering not only the initial elements of the titles, abstracts, and keywords, but also the introduction, methodology, and conclusion of the studies, and reapplying the inclusion and exclusion criteria. The decision not to read the selected texts in their entirety is primarily based on the central focus of the research, which directs its attention to the evaluation and analysis of the methodologies employed in the included studies. In this context, the methodological approach becomes the main element for achieving the proposed objectives.

2.5. Data extraction

After finalizing the selection of articles to be included in the review, a data extraction form was developed, considering the objectives of this study. The form contains basic information about

TABLE 2 – Search strategy for articles for SLR.

Database	Search in	String used
Web of Science	title, abstract, author keywords, and Plus keywords	• “climate justice” (Topic) and “qualitative” (All Fields)
Scopus	title, abstract, and keywords	• TITLE-ABS-KEY (“climate justice” AND “qualitative”) AND PUBYEAR > 2011
SciELO	Abstract	• (ab:(climate justice)) AND (ab:(qualitative)) • (ab:(justiça climática)) AND (ab:(qualitativa)) • ab:(justiça climática)

SOURCE: The authors.

the articles analyzed, such as bibliographic data (authors, title, abstract, keywords, year of publication, among others), as well as a summary of the methodologies used and personal reflections on the study methodology (see supplementary data).

During the pilot stage, five articles were analyzed, and the extraction process was tested. Some modifications were implemented after the pilot phase, culminating in the finalization of the extraction form. Table 3 shows the protocol for data extraction.

TABLE 3 – Protocol applied for data extraction from the SLR.

01 – General characteristics	<ul style="list-style-type: none"> • Title; • DOI (Digital Object Identifier) • Authors • Authors’ affiliations • Year of Publication • Publication Type • Source • Author Keywords and Additional Keywords • Abstract • Language • Research Areas • Country and Continent of Publisher
02 – Methodology and Analysis	<ul style="list-style-type: none"> • Purpose of the study • Methods • Study Design (Qualitative) • Project details • Start date • End date • Duration of the study • Country and continent where the study was conducted • How was the data analyzed?
03 – Characteristics of participants	<ul style="list-style-type: none"> • Description of the population • Number of participants • Background • Sampling strategy • Age group • Sex • Race or ethnicity • Eligibility criteria • Who was the main group involved?
04 – Aspects of Climate Justice	<ul style="list-style-type: none"> • Distributive, Procedural, Recognition, or none in particular

SOURCE: The authors.

The table with data extracted from the included studies is available in Supplementary Material 3. The next step, which includes the review, synthesis, presentation of results, and discussion, will be presented in the next section.

3. Presentation and discussion of results

A total of 162 publications were imported from the three databases consulted for screening, comprising 161 individual studies. Through automatic identification by the *Covidence* platform, 44 duplicate studies were located, and through manual verification, another six duplicates were identified. Thus, 111 studies underwent screening based on title, abstract, and keywords, resulting in the exclusion of 64 studies. Next, a more in-depth reading was carried out, also covering the introduction, methodology, and conclusion of the studies (again applying the inclusion and exclusion criteria). Among the 48 studies analyzed, 13 were excluded: eight of them contained relevant words in the abstract, but the topic of climate justice was used marginally in the text; three lacked a description of the methodology; one study was unavailable; and one study was classified as quantitative. Ultimately, 34 studies were included in the SLR (Figure 2).

3.1. General characteristics of the studies

3.1.1. Type of studies and subjects

The vast majority of studies were presented in the form of articles, totaling 30, with only two systematic reviews (Torres *et al.*, 2021; Cairney

et al., 2023) and two book chapters (Nunes, 2023; Vélez, 2023). The chapters were included due to their contribution to broader coverage of the topic, significantly contributing to the understanding and scope of the SLR in question. The main language used among the 34 selected articles was English ($n = 30$), while two texts were written in Spanish (Martínez, 2023; Santamaria & Múnera, 2023) and two in Portuguese (Cavalcanti *et al.*, 2022; Torres *et al.*, 2021).

Among the 34 studies analyzed, the theme of climate justice involved a wide range of disciplines. The categorization of subjects was determined based on the information available in the databases consulted and, in the absence of such information, was developed inductively through content analysis and descriptions of the publications. When more than one discipline was indicated in a single study, the most predominant discipline was selected. Thirteen distinct areas were identified, with Environmental Sciences and Ecology being the key area with the highest occurrence (17.6%, $n = 6$), followed by Government and Law (14.7%, $n = 5$) and Development (11.8%, $n = 4$). Geography, Education, and Sociology recorded three occurrences each, corresponding to 8.8% each. Meanwhile, International Relations, Psychology, and Urban Studies had two occurrences each, representing 5.9% each. Finally, four areas appeared only once: Public Administration, Agroecology, Social Anthropology, and Communication.

3.1.2. Location where the study was conducted

Regarding the location where the qualitative

SYSTEMATIC REVIEW - What are the qualitative methodologies used in academic research on climate justice?

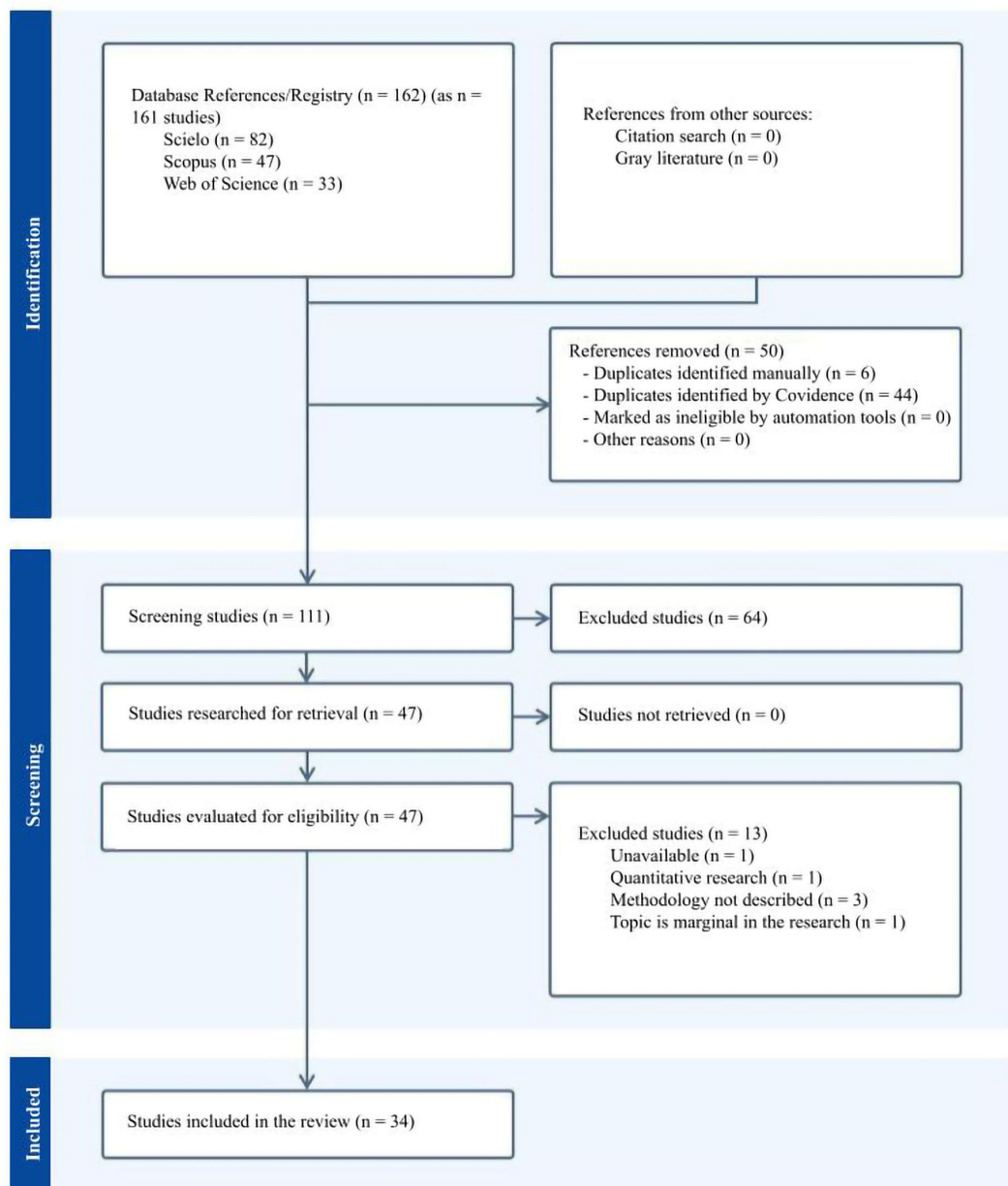


FIGURE 2 – PRISMA procedures used in the SLR with support from the *Covidence* platform⁵.

SOURCE: Survey data.

⁵ *Covidence* is a workflow platform that makes it easier and faster to gather all published research worldwide and turn it into reliable summaries of scientific knowledge.

study was conducted, two did not specify the location. Twenty-one studies focused exclusively on a single country for the development of their research, while 11 studies addressed the study in two or more countries. Figure 3 shows the distribution of studies worldwide.

Among the studies that focused on a single country, four were conducted in the United States, three in England, and three in Canada, followed by two studies conducted in Brazil. The remaining studies were conducted in countries located in Asia (Bangladesh, South Korea); Europe (Norway, Belgium, Portugal, Czech Republic); the Americas (Puerto Rico, Colombia); and Africa (South Africa). It should

be noted that a deliberate strategy was adopted to include research focused on Brazil, as there is a clear prevalence of studies concentrated on other countries outside the Global South.

Among the 34 articles selected for the SLR, it was found that 76.5% ($n = 26$) were published by authors affiliated with institutions located in the Global North. On the other hand, 11.8% ($n = 4$) of the studies were conducted by researchers associated with institutions in the Global South, while the remaining 11.8% ($n = 4$) involved collaborations between researchers from the South and the North. This predominance of studies from the Global North reflects structural disparities that limit the visibility and appreci-

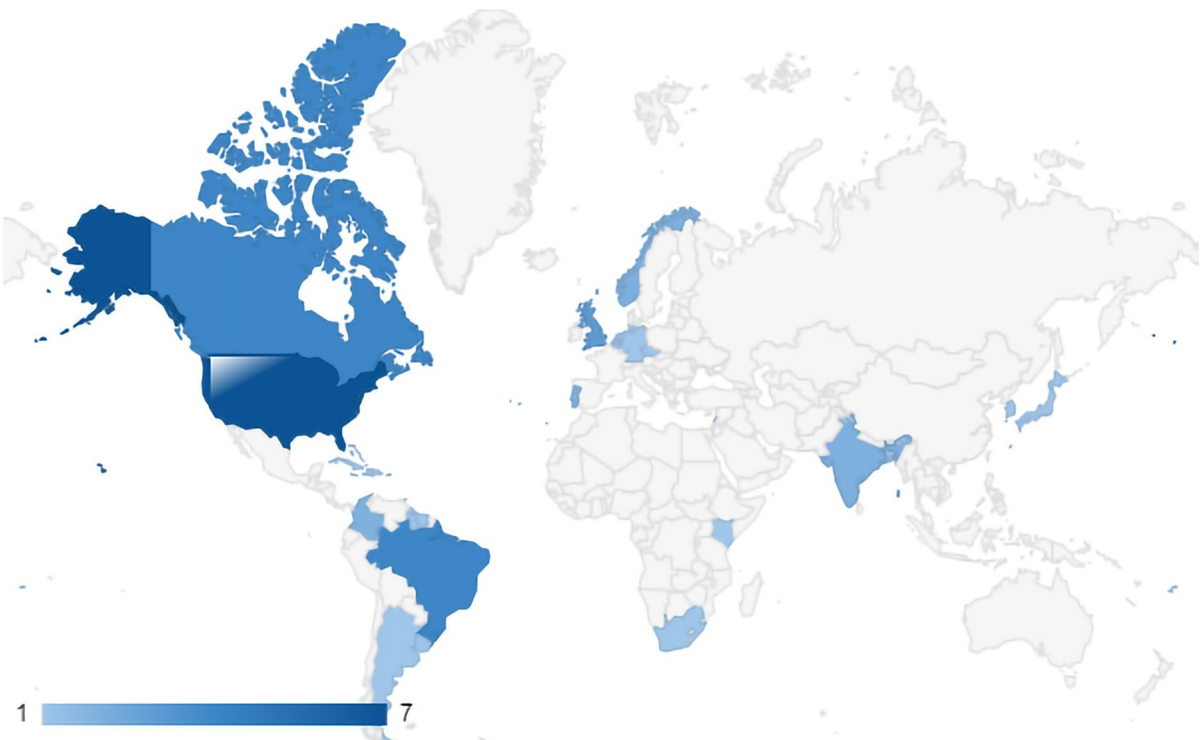


FIGURE 3 – Location of studies selected by SLR.
SOURCE: Survey data.

ation of voices from the Global South, which are underrepresented in academic production. The lack of greater involvement by the Global South implies a gap in the recognition of local knowledge, which is often closer to the challenges experienced by vulnerable populations. This underrepresentation directly impacts the epistemological diversity necessary for global solutions to be effective and culturally contextualized. Furthermore, it reinforces historical inequalities by privileging perspectives from the Global North in the formulation of research agendas and the definition of academic and political priorities.

3.1.3. *Number of academic publications on the topic in the last decade*

It can be observed that there is an irregular distribution over the years (Figure 4), with the number of publications per year showing a more significant number of records only from 2021 onwards, representing 76.5% ($n = 26$), while other years have between one and three occurrences.

In recent years, there has been a significant increase in attention to climate justice, which several interrelated factors may have driven. Firstly, the historic decision to establish the first pavilion

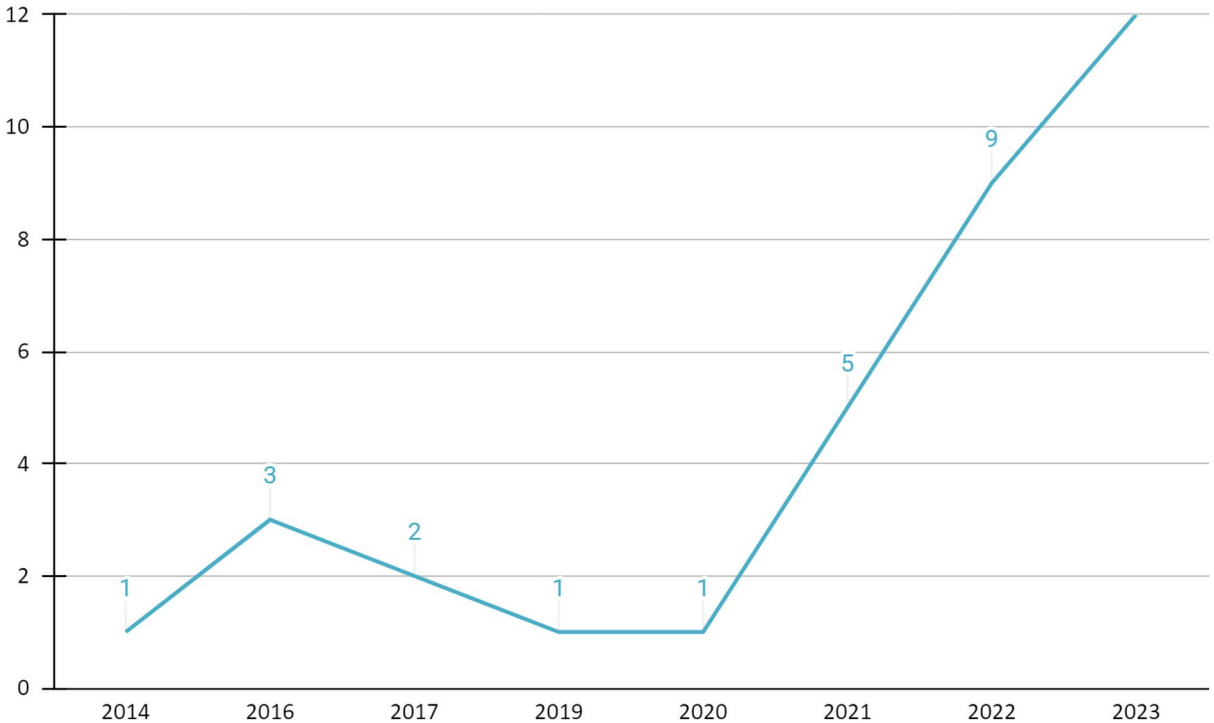


FIGURE 4 – Number of publications on Climate Justice per year.
SOURCE: Survey data.

exclusively dedicated to climate justice at COP 27 in 2022 highlighted the growing importance of this issue in global climate negotiations. In addition, the intensification of extreme weather events has contributed to raising awareness of the unequal impacts on vulnerable populations. Social mobilization and inclusion in the public agenda have also driven academic research on climate justice. Finally, grassroots movements have increased pressure on governments and institutions to address issues of climate equity and intergenerational justice.

3.2. What do studies on climate justice address?

3.2.1. Keywords from the studies

Among the 34 studies analyzed, nine (9) did not include keywords. Of the 138 keywords found in the studies, 116 were used only once, and only five were repeated more than once. The most frequently used keyword was “climate justice”, with 14 occurrences, followed by “climate change”, with 10 occurrences. The others were repeated twice: “climate change education”, “environmental justice”, and “social movements”.

The keywords allowed us to understand what the central themes of qualitative studies on climate justice have been. The wide range of keywords highlighted the complexity of these studies, covering environmental, social, political, cultural, and psychological dimensions. It is important to note that, although these keywords provide clues about the thematic focus of the studies, some texts did not explore the issues relevant to the keywords themselves in depth.

However, this has not diminished the importance of keywords as a valuable starting point. The first theme that runs through the studies is climate justice itself, but other adjectives for justice were also considered, such as “social justice” and “environmental justice”, among others. The next axis was climate change, combined with various terms that addressed the issue directly or even related it to its impacts and effects, such as “carbon dioxide emissions” and “climate gentrification”, among others. The next thematic axis gained prominence for linking responses to climate change with political and governance dimensions, ranging from the local to the global scope. This interest is evidenced by keywords such as “democracy,” “participation,” and “direct action.” At the same time, a series of terms focused on social issues, incorporating “citizenship,” “inequality,” and “social movements,” among others. Certain terms pointed to specific locations, reflecting a focus on the unique characteristics of various contexts, such as “Caribbean,” “CARICOM,” “South Korea,” and “southwestern coastal region of Bangladesh.” Terms such as “capacity-based approach,” “participatory action research,” “decolonial approaches,” and “Legitimacy Code Theory” suggest a diversity of theoretical and methodological approaches to analyzing and addressing issues of climate change and justice. In addition, the studies also highlighted the importance of climate education related to the topic, including keywords such as “climate change education”, “climate justice education”, and others.

Due to the intrinsic connection between climate justice and populations that are in a position

of greater vulnerability – which, paradoxically, contribute less to the problem – vulnerability emerged as a recurring theme, with the keywords “vulnerability,” “vulnerability assessment,” and “social vulnerability” pointing to the need to understand who is most vulnerable to climate change.

An additional aspect that deserves mention concerns the inclusion of the term “climate justice” in the keywords of several studies that were subsequently excluded from the SLR. Despite the presence of terminology in the keywords and abstracts of the studies, the content or approach to the topic proved insufficient or only tangential. This result shows a discrepancy between the intention initially signaled by the keywords and the actual treatment of the topic in the study. This finding raises questions about the depth with which the issue of climate justice is being addressed in current academic literature. Although the inclusion of the term “climate justice” in the keywords denotes recognition of the importance of and growing academic interest in the issue, the subsequent lack of substantive content or in-depth analysis of the studies points to a superficial approach in most of the selected publications.

3.2.2. Which dimensions of climate justice were studied?

Torres *et al.* (2021) highlight that there is no single definition of climate justice in the literature. However, Kang and Lee (2024) highlight three fundamental pillars for understanding the multifaceted dimensions of justice in the context

of climate change: distributive, procedural, and recognition aspects. To help develop a more comprehensive and contextualized analysis, given the complexity and variety of perspectives present in the literature on climate justice, the three aspects associated with climate justice were categorized from the 34 studies selected for this SLR. The categorization of aspects associated with climate justice was conducted inductively, involving an in-depth analysis of the content of the studies and a careful interpretation of the available information. As a result, the three fundamental aspects of climate justice (distributive, procedural, and recognition) were observed in 50.0% of the studies analyzed ($n = 17$), as shown in Table 4.

A share of 17.6% ($n = 6$) of the studies focused on the combined analysis of two of these pillars of climate justice: three studies emphasized the intersection between distributive justice and recognition; another three addressed distributive justice in conjunction with procedural justice. On the other hand, 17.6% ($n = 6$) of the studies prioritized only one aspect of climate justice: four of them focused specifically on distributive justice and two on procedural justice. In addition, 14.7% ($n = 5$) of the studies did not focus on any particular aspect of climate justice. The growing understanding of the importance of a comprehensive approach to climate justice, evidenced by the intersection of the pillars of justice in almost half of the studies, highlights a significant trend in current research (Mohtat & Khirfan, 2021). While some studies may choose to focus exclusively on one aspect of climate justice for a more in-depth analysis, the growing prevalence of studies that consider multiple pillars suggests

TABLE 4 – SLR studies that addressed the three fundamental pillars of climate justice according to Kang and Lee (2023).

Pillars			
Distributive They refer to the equitable distribution of the benefits and burdens resulting from climate change, mitigation, and adaptation policies. This indicates a significant concern with the fair allocation of climate-related resources, risks, and responsibilities.			
Procedural They highlight the need for fair, transparent, and inclusive processes that ensure the equitable participation of all stakeholders, especially those most vulnerable to the impacts of climate change.			
Recognition They defend the importance of recognizing and valuing the diversity of identities, cultures, and knowledge of communities affected by climate change. This implies the need to address structural inequalities and historical injustices that perpetuate the vulnerability of certain groups.			
No. of pillars / Authors / No. of studies			
Three pillars 50.0% (n = 17)	Two pillars 17.6% (n = 6)	One Pillar 17.6% (n = 6)	None Pillar 14.7% (n = 5)
Distributive, Procedural, Recognition (n = 17) <ul style="list-style-type: none">• Ashrafuzzaman <i>et al.</i> (2022)• Bopp & Bercht (2021)• Cairney <i>et al.</i> (2023)• Cavalcanti <i>et al.</i> (2022)• Kang & Lee (2024)• Martínez (2023)• Nulman (2017)• Nussey <i>et al.</i> (2022)• Shokry <i>et al.</i> (2022)• Stoddart & Smith (2016)• Torres <i>et al.</i> (2021)• Vamvalis (2023)• Vasquez Santamaria & Restrepo Múnera (2023)• Vélez (2023)• Zape (2023)• Wilkens & Datchoua-Tirvaudey (2022)• Wood & Meyer (2022)	Distributive and procedural (n = 3) <ul style="list-style-type: none">• Aránguiz & Sannazzaro (2024)• Rudge (2021)• Madénian & Van Neste (2023) Distribution and recognition (n = 3) <ul style="list-style-type: none">• Stapleton (2019)• Ritter & Thaler (2023)• Howard (2022)	Distributive (n = 4) <ul style="list-style-type: none">• Novák (2022)• Robinson (2020)• Gray (2023)• Nunes (2023) Procedural (n = 2) <ul style="list-style-type: none">• Derman (2014)• Hadden (2014)	<ul style="list-style-type: none">• Kenis (2016)• Szenes (2021)• Bührle & Kimmerle (2021)• Hinks & Rödder (2023)• Whitmarsh & Corner (2017)

SOURCE: Survey data.

a broader recognition of the complexity and interdependence of the challenges faced.

It is important to highlight that recent studies, inspired by critical race theory and feminist studies, show that some academics have defended the need for an intersectional lens in

the field of climate justice (Newell *et al.*, 2021; Amorin-Maia *et al.*, 2022). On the other hand, this overview reveals that studies still address the dimensions of climate justice in a very limited way. The pillar of Climate Justice that deals with recognition, for example, was addressed in only

18 of the 34 studies analyzed. In other words, it is precisely this dimension that emphasizes the importance of recognizing and valuing the diversity of identities, cultures, and knowledge of communities affected by climate change (Mohtat & Khirfan, 2021; Kang & Lee, 2024). An integrated approach to the pillars underpinning the concept of climate justice is essential to developing effective and holistic solutions to climate problems, recognizing that issues of equity, resource distribution, and decision-making processes are intrinsically linked (Mohtat & Khirfan, 2021). It should also be noted that this review highlights studies that do not focus on any specific pillars, thereby showcasing the diversity of perspectives and approaches within the field of climate justice. This result points to the ongoing need for dialogue and interdisciplinary collaboration to address climate challenges in an increasingly comprehensive manner, addressing their causes, impacts, and potential solutions to operationalize Climate Justice (Chu & Cannon, 2021; Kashwan, 2021; Hess & McKane, 2021), to meet demands focused on the priorities of vulnerable communities (Amorim-Maia *et al.*, 2022). Ultimately, this variety of approaches reflects the complexity of climate justice as a field of research and the importance of multifaceted analysis to inform concrete policies and actions toward a more sustainable and equitable future.

3.3. Methodological procedures of the studies

The research extensively reviewed climate justice issues, exploring qualitative methodologies and a variety of contexts and timeframes.

Various methods, such as interviews and content analysis, were used, highlighting the multifaceted approach adopted by most studies. The research subjects ranged from individual activists to populations directly affected by climate change. The studies covered different periods, reflecting the global complexity of these issues. The importance of an interdisciplinary and holistic approach to addressing climate change equitably and promoting awareness and action on climate justice is highlighted.

3.3.1. Subjects who were the target of wiretapping/investigation

Among the 34 studies examined, three main target audiences of interest to climate justice research can be identified: activists (individual actors), social movements (collective actors), and populations directly affected by the effects of climate change.

It is noteworthy that, of the seven studies (20% of all articles) targeting activists (individual actors), five focus on subjects from the Global North, while one does not specify the profile of the study target and only one study directly addresses activists from the Global South, as shown in Table 5. The disparity in the representation of activists from the Global North and South in studies, as shown in this SLR, raises significant questions about climate justice research. While activists in the Global North have access to resources for research and more developed and established networks for publication, it is often activists and populations in the Global South who face the most severe impacts of climate

TABLE 5 – Grouping of studies by three main target audiences analyzed.

Category	Author	Description of the target audience studied	North	South	Both
Activists (individual actors)	Aránguiz & Sannazzaro (2024)	Twelve young people from three South American countries (Argentina, Colombia, and Uruguay) participated in the workshop “Education, Youth, and Climate Justice” held at the Third Open Forum on Science in Latin America and the Caribbean.		✗	
	Bührle & Kimmerle (2021)	Students engaged in climate justice initiatives, selecting participants based on their active involvement in educational and political work related to the climate cause.	✗		
	Hadden (2014)	Activists and civil society groups are involved in transnational activities related to climate change conferences, especially those linked to UNFCCC meetings.		Not Defined	
	Howard (2022)	Mothers and fathers in the United Kingdom who are mobilizing to address climate change. Participants were selected from individuals concerned about the impacts of climate change on their children’s future and involved in related campaigns.	✗		
	Hinks & Rödder (2023)	Communication from <i>Extinction Rebellion</i> (XR) in the United Kingdom, examining how the organization incorporates scientific knowledge into its narrative about the future of the climate.	✗		
	Novák (2022)	Climate activism in the Czech Republic focuses on bodily practices of mass civil disobedience, such as the occupation of fossil fuel infrastructure during climate camps.	✗		
	Nunes (2023)	20 Portuguese activists, representing significant periods of activism in Portugal, covering different cycles of protest, from the Carnation Revolution to contemporary movements for global justice.	✗		
	Vamvalis (2023)	Three young activists involved in the climate justice movement in Canada. Two of these activists were residents of Ontario, participants in the <i>Fridays for Future</i> movement, while the third was originally from <i>British Columbia</i> .	✗		
Category total			6	1	0
Social move- ment (collec- tive actor)	Cavalcanti <i>et al.</i> (2022)	Social occupation movements.		✗	
	Derman (2014)	Transnational civil society groups advocating for climate justice.			✗
	Kenis (2016)	Environmental movements in the Global North, while Ritter & Thaler (2023) address global environmental non-governmental organizations (ENGOS).	✗		
	Nulman (2017)	Role of solidarity movements in the Global North.	✗		
	Robinson (2020)	Intersection between environmental movements and labor movements.	✗		
	Rudge (2021)	Community-based organizations (CBOs).	✗		
Category total			4	1	1
Communities directly im- pacted	Ashrafuzzaman <i>et al.</i> (2022)	He has dedicated himself to understanding the experiences and challenges faced by climate-vulnerable community families.		✗	
	Bopp & Bercht (2021)	It focused specifically on farming and fishing communities, recognizing their vulnerability and the need to address their unique challenges in the face of climate change.			✗
	Gray (2023)	It examined complex issues related to disaster waste, seeking ways to mitigate its impacts and strengthen the resilience of affected communities. These studies demonstrate the promotion of more equitable and participatory approaches to addressing contemporary climate challenges.	✗		
	Shokry <i>et al.</i> (2022)	He explored the emerging concept of climate gentrification, examining how local communities are being affected by ongoing environmental and socioeconomic transformations.	✗		
	Vélez (2023)	Promoters and producers of agroecology, highlighting the fundamental role of these actors in promoting sustainable agricultural practices and adaptation to climate change.		✗	
	Wilkins & Datchoua-Tirvaudey (2022)	Focus on the rights of stakeholders, including activists, academics, and professionals, highlighting the importance of ensuring the participation and representation of these groups in decisions that impact their lives.			✗
Category total			2	2	2

SOURCE: Survey data.

change. Their voices and perspectives are essential to fully understand the dynamics of climate injustice and develop effective and equitable solutions. Ignoring or underrepresenting the experiences of the Global South can result in an incomplete understanding of the complexities of climate issues and the needs of the most vulnerable communities.

Publications related to civil society movements or organizations and their role in promoting climate justice accounted for 17.6% ($n = 6$) of the studies, revealing a diversity of approaches and perspectives. These studies offered a comprehensive overview of the diverse forms of civil society engagement in the fight for climate justice, highlighting the importance of multifaceted and collaborative approaches to addressing global climate challenges. However, there is also a noticeable absence of studies addressing civil society movements or organizations in the Global South. Of the studies analyzed, four focus on organizations in the Global North, one involved both (Derman, 2014), and only one focused exclusively on the South (Cavalcanti *et al.*, 2022). This finding highlights the need for diversity and representation in academic research, especially in the field of climate justice. Although studies from the Global North can contribute significantly to the debate, it is essential to ensure an inclusive approach that incorporates diverse perspectives and experiences, reflecting the complexity and diversity of challenges faced by communities in different contexts, geographical territories, and socioeconomic conditions. This imbalance, as shown by the focus of the selected publications, may reflect structural inequalities in academic

research, where the perspectives and experiences of organizations from the South are underrepresented or even neglected. Such disparity not only limits comprehensive understanding of the dynamics of climate justice but also perpetuates a distorted, neocolonialist, and partial view of the problem, which may not adequately capture the nuances and complexities of climate issues in diverse global contexts.

The next category brought together studies dedicated to understanding populations directly impacted by the effects of climate change, representing 17.6% ($n = 6$) of the total selected studies. It is worth noting that the perspectives of residents in communities most affected by climate change are not always incorporated into discussions about solutions or considered in academic studies. Thus, in addition to presenting an approach that focuses on populations directly affected by climate change, these studies share a concern with including the voices and perspectives of these communities in dialogues on climate-related solutions and policies. The remaining studies accounted for 38.2% ($n = 13$) of the 34 selected by the SLR, covering a variety of topics or failing to clearly define the target audience of the study, as shown in Table 6.

It should also be noted that, among the 34 studies analyzed in this SLR, only six studies specified the age range, varying from 16 to 68 years. Five studies included in the analysis specified the gender of participants, identifying them as cisgender male or female. Among these, four studies were conducted with participants of both cisgender male and female genders, of which three presented a percentage distribution

TABLE 6 – List of studies with varied topics or without a defined target audience.

Author	Description of the study target	North	South	Both
Cairney <i>et al.</i> (2023)	He focused on politics and policy-making to promote climate justice.		Not defined	
Kang & Lee (2024)	Analyzed the coastal areas of South Korea.	×		
Madénian & Van Neste (2023)	He studied the role of philanthropic foundations.	×		
Martínez (2023)	It focused on Small Island Developing States.		×	
Nussey <i>et al.</i> (2022)	Investigated higher education institutions.		×	
Stapleton (2019)	He focused on youth.	×		
Szenes (2021)	He analyzed neo-Nazi environmentalism.	×		
Stoddart & Smith (2016)	He examined articles published in two Canadian newspapers that address the relationship between climate change and the Arctic.	×		
Torres <i>et al.</i> (2021)	He studied strategies for adapting to climate change in Brazil and Portugal.			×
Santamaria & Múnera (2023)	He has investigated court cases involving socio-environmental conflicts in Colombia.		×	
Whitmarsh & Corner (2017)	Investigated UK citizens with center-right political views.	×		
Wood & Meyer (2022)	He examined narrative justice.		×	
Zape (2023)	Examined gender vulnerabilities in Brazilian state laws addressing climate change.		×	
Total		6	5	1

SOURCE: The authors.

close to 50% for each gender, while one study did not specify the proportion of each gender. Only one of the studies focused exclusively on women.

With regard to race and ethnicity, only four studies included in the SLR specified the participants. Among these, one study categorized participants as white and “racialized”; another involved black, yellow (Asian), white, and mixed-race participants (e.g., white and Asian). One of the studies included black, white, South Asian, Chinese-American, Hmong-American, a

biracial student, and a Latina participant. And a study that defined the race/ethnicity of its participants indicated that, of the three participants, two were white.

3.3.2. *Qualitative or mixed (quali-quantitative) research strategy*

Given that the scope of the SLR focused on qualitative studies, strictly quantitative studies were excluded from the analyzed set. Within the

scope of this SLR, 24 exclusively qualitative studies were identified, while another 10 adopted mixed approaches (Hadden, 2014; Stoddart & Smith, 2016; Nulman, 2017; Whitmarsh & Corner, 2017; Rudge, 2021; Shokry *et al.*, 2022; Ashrafuzzaman *et al.*, 2022; Hinks & Rödder, 2023; Kang & Lee, 2024; Ritter & Thaler, 2023). Therefore, it is noted that a considerable portion of the selected studies adopted mixed methodologies, that is, they incorporated both qualitative and quantitative approaches in their execution⁶. Creswell (2012) highlights the logic behind mixed methods: quantitative data, such as numbers and indicators, can be analyzed using statistics (frequency, mean, median, mode, etc.) and reveal useful, quick, and reliable information about a large number of observations. Qualitative techniques, such as open interviews, provide information about the interviewees' own speech, offering different perspectives on the topic and outlining the subjective aspects of the phenomenon.

Thus, although the main focus of this SLR is on qualitative research, the use of mixed methodologies indicates a recognition of the importance and value of combining different methods for a more comprehensive understanding of climate justice, thus allowing researchers to explore both qualitative dimensions (such as perceptions, experiences, and meanings) and quantitative dimensions (such as frequencies, correlations, and statistics) of the phenomena studied, offering a richer and more in-depth view. The data collection methods and techniques were summarized in Figure 5.

3.3.3. *Technique and information on data collection*

The number of participants in the 34 studies examined varied considerably, ranging from 3 to 2088 individuals. Notably, a significant proportion of studies (44.1%, $n = 15$) did not specify the size of the target population. Among those who provided such specification, 26.5% ($n = 9$) included a sample of 11 to 30 participants, followed by 17.6% ($n = 6$) who involved between 40 and 100 participants. A minority corresponding to 8.8% ($n = 3$) employed between 1 and 10 participants, while only 2.9% ($n = 1$) had more than 100 participants.

The variety in the number of participants in the studies analyzed is intrinsically linked to the methodologies adopted, reflecting the complexity and nuances of climate justice research. In particular, the choice between qualitative and quantitative methods plays a key role in determining sample size. Studies that employ interviews, observation, participants, and other qualitative techniques tend to have smaller samples due to the intensive nature of these techniques. The depth and richness of data obtained through in-depth interviews or detailed case studies require a substantial investment of time and resources from the researcher (Tracy, 2019). It is therefore understandable that a significant proportion of these studies have smaller samples, allowing for a more in-depth analysis of individual experiences and social dynamics surrounding climate justice.

On the other hand, *survey-type* research, which aims to collect quantitative data from a

⁶ Mixed methodologies incorporate a combination of quantitative and qualitative techniques into the collection and analysis procedures within the same research design. The central assumption that justifies the multi-method approach is that interaction between them provides better analytical possibilities (Creswell, 2012).

Author/Year	Type of research		Methodology				Data collection techniques					Data Type		Analysis technique
	Qualitative	Mixed (quali-quant)	Case Study	Survey	Action Research	Systematic Review	Interview	Documentary survey	Participant observation	Questionnaire	Other	Primary	Secondary	
Aránguiz & Sannazzaro, 2024	✓		✓				✓				Workshop	✓		Narrative analysis
Ashrafuzzaman <i>et al.</i> , 2022		✓	✓	✓			✓			✓	Interactive sessions (discussion groups, workshops)	✓	✓	
Bopp & Bercht, 2021	✓		✓		✓		✓		✓		Informal discussions, exploratory mapping	✓		
Bührle & Kimmerle, 2021	✓						✓					✓		
Cairney <i>et al.</i> , 2023	✓					✓		✓					✓	
Cavalcanti <i>et al.</i> , 2022	✓		✓										✓	
Derman, 2014	✓						✓		✓		Documentary evidence published by groups, open forums, workshops	✓		
Gray, 2023	✓		✓				✓	✓	✓		On-site visits	✓		
Hadden, 2014		✓	✓				✓	✓			Fieldwork	✓	✓	
Hinks & Rodder, 2023		✓					✓	✓	✓		Online press release survey	✓		Narrative analysis, document analysis
Howard, 2022	✓		✓				✓	✓			Field diary	✓		
Kang & Lee, 2024		✓						✓			Scoping diagram (1)		✓	Vulnerability scoping diagram
Kenis, 2016	✓						✓	✓				✓	✓	Conceptual-empirical discussion based on grounded theory
Madénian & Van Neste, 2023	✓		✓				✓	✓	✓			✓	✓	Document analysis
Martínez, 2023	✓							✓			Academic and opinion articles published in the press and on websites		✓	
Novák, 2022	✓						✓		✓			✓	✓	
Nulman, 2017		✓						✓					✓	Content analysis
Nunes, 2023	✓						✓	✓	✓			✓		Thematic content analysis
Nussey <i>et al.</i> , 2022	✓				✓			✓			Stakeholder analysis, knowledge sharing activities, and reflections	✓	✓	
Ritter & Thaler, 2023		✓	✓	✓				✓					✓	Content analysis, discourse analysis (2)
Robinson, 2020	✓						✓	✓		✓		✓		
Rudge, 2021		✓	✓	✓				✓		✓	Georeferenced location map of communities	✓	✓	
Santamaria & Múnera, 2023	✓		✓					✓			Judgments issued by the Judiciary		✓	
Shokry <i>et al.</i> , 2022		✓					✓	✓			Use of georeferenced quantitative data	✓	✓	Content analysis
Stapleton, 2019	✓						✓					✓		Narrative analysis of stories
Stoddart & Smith, 2016		✓						✓			Accidental ethnography	✓	✓	Discourse network analysis (DNA) and qualitative textual analysis
Szenes, 2021	✓							✓					✓	Qualitative textual analysis (3)
Torres <i>et al.</i> , 2021	✓					✓		✓					✓	
Vamvalis, 2023	✓						✓				Group discussion	✓		
Vélez, 2023	✓		✓				✓		✓		Personal experiences as a brigade volunteer	✓	✓	Content analysis
Whitmarsh & Corner, 2017		✓		✓							Group discussion	✓	✓	
Wilkens & Datchoua-Tirvaudey, 2022	✓						✓		✓		Accidental ethnography, observation notes	✓		Grounded framework
Wood & Meyer, 2022	✓										Personal accounts	✓		
Zape, 2023	✓							✓					✓	

Captions

(1) This methodology is a qualitative approach that provides an efficient mechanism to guide the collection and organization of data, concepts, and indicators needed to assess vulnerabilities in specific sectors. The methodology involves the development of a VSD (Vulnerability Scope Diagram) to define the scope of vulnerability and identify specific indicators for low-carbon coastal transition vulnerability.

(2) Use of NVIVO software; Visone software; and Discourse Network Analyzer (DNA) software.

(3) System of APPRAISAL (Systemic Functional Linguistics (SFL) and Legitimation Code Theory (LCT))

FIGURE 5 – Study methodologies

SOURCE: Survey data.

representative sample of the population, generally requires larger samples to ensure the statistical validity of the conclusions (Tracy, 2019). These studies can cover a wider range of participants and contexts, aiming to generalize the results. Thus, the varied distribution in the number of participants reflects not only the different methodological approaches adopted, but also research priorities, resource availability, and the complexities inherent in the study of climate justice. This diversity of methodological approaches enriched the findings of this SLR, allowing for a more comprehensive understanding of issues related to climate justice in different contexts and communities surveyed.

Of a total of 34 studies analyzed, 55.9% ($n = 19$) did not provide information on the date when data collection was performed. As previously mentioned, the studies selected for this review were from 2014 onwards; however, it is common in research for studies to be published in a given year, while data collection may have taken place in previous periods. Thus, of the 15 studies that specified the data collection period, it was observed that collection began in 2007 and extended until 2023. There was a variety in the collection time, ranging from 1 month to 6 years. More specifically, 23.5% of the studies ($n = 8$) collected data for a period ranging from one month to one year, while 8.8% ($n = 3$) exceeded one year and another 11.8% ($n = 4$) extended data collection for more than two years. These results show the attention paid to the longer timeframes required by studies using qualitative methodology.

Most studies (64.7%, $n = 22$) adopted a

multifaceted approach to data collection, while the remainder (35.3%, $n = 12$) chose to employ only one technique. For comparison purposes, priority was given to the main data collection technique used in each study. Interviews emerged as the most prevalent technique, accounting for 55.8% ($n = 19$) of the methodological procedures used by qualitative and mixed studies on climate justice.

Case studies were used in 35.3% ($n = 12$) of the 34 selected publications. It is noteworthy that, within the case studies, interviews were used in eight of the 12 studies, with only one study relying on documentary research. Two studies conducted systematic reviews of the literature, representing 5.9% ($n = 2$) of the sample. The remainder encompassed a variety of techniques, including vulnerability scope diagrams (Kang & Lee, 2024), climate fiction and life stories, focus groups (Whitmarsh & Corner, 2017; Ashrafuz-zaman *et al.*, 2022) and *online* experimental research (Hinks & Rödder, 2023), as well as ethnographic research (Stoddart & Smith, 2016; Howard, 2022). The analyses also proved relevant, and content analysis, document analysis, and comparative analysis were adopted.

By exploring the methodologies employed in greater depth, it is clear that the choice of data collection techniques reflects the complexity and diversity of studies on climate justice. Interviews, as the most common technique, offer a unique opportunity to capture the experiences, perspectives, and perceptions of participants directly affected by climate change and mitigation and adaptation policies. Through these qualitative accounts, researchers can contextualize and give

space to the narratives of local communities, activists, NGO leaders, and other *stakeholders* involved in the struggle for recognition, an important pillar of climate justice (Kang & Lee, 2024; Hinks & Rödder, 2023). The use of interviews is a technique that further enriches the understanding of the phenomena studied, offering a holistic and detailed view of the challenges and opportunities faced by affected communities, as highlighted by Amorim-Maia *et al.* (2022) and Newell *et al.* (2021). The case studies, in turn, pointed to a more in-depth and contextualized analysis of specific situations, providing detailed insights into the social, political, and environmental dynamics related to climate justice in particular contexts.

The other data collection techniques presented encompass different approaches to gathering and analyzing information in diverse contexts. Workshops and interactive sessions, such as discussion groups (Aránguiz & Sannazzaro, 2024), were widely used methods in the studies analyzed, as they promote the exchange of ideas and exploratory mapping of themes (Bopp & Bercht, 2021). Other techniques such as open forums (Derman, 2014), on-site visits (Gray, 2023), accidental ethnography (Stoddart & Smith, 2016) and personal experience (Velez, 2023) have also shown how important they are, since they give access to primary sources and direct interactions with the communities or environments being studied, providing valuable qualitative data through immersion in real situations. Another technique of great importance for research on climate justice was the georeferencing of data, whether through location maps or quantitative

data, as this allows for more accurate spatial analysis (Shokry *et al.*, 2022; Rudge, 2021).

On the other hand, diversifying data sources, such as analyzing sentences handed down by the Judiciary (Santamaria & Múnera, 2023) or the experience report as a firefighter (Velez, 2023) show the importance of diversifying perspectives and practices related to the topic under study, broadening the understanding of how other *stakeholders* act under the lens of Climate Justice (Wilkins & Datchoua-Tirvaudey, 2022). Another point highlighted by the articles selected here was the importance of using tools that support fieldwork, including protocols and field diaries as common practice for observation and data recording in various contexts (Hadden, 2014; Howard, 2022; Gray, 2023). In summary, the selected articles presented a variety of approaches to data collection and analysis, each offering unique and complementary insights. For a deeper understanding of the data collection methods and techniques, we recommend consulting the supplementary table for this study, available in Supplementary Material 3.

Among the analysis techniques used in the 34 selected publications, content analysis was the most prevalent technique, considering that it plays a crucial role in interpreting and synthesizing large volumes of information, such as political documents, NGO reports, academic articles, and other sources of textual data. This highlighted the relevance of this technique for identifying patterns, themes, and emerging trends in discourses and practices related to climate justice, contributing to a more comprehensive and informed analysis. However, it is noteworthy that

the low use of other techniques such as narrative or discourse analysis reveals that studies located in this SLR still lack a deeper understanding of climate justice centered on the perspectives of the subjects involved. In the same vein, systematic literature reviews, which are less frequent among the studies analyzed, play a fundamental role in synthesizing and critically evaluating existing knowledge on a given topic, providing an overview of the available evidence and identifying gaps for future research.

4. Final thoughts

This SLR delved into a series of topics studied in the field of climate justice, investigating its qualitative research methodologies and addressing the diversity of contexts and temporalities involved. Studies on climate justice constitute a multidisciplinary field of research that addresses fundamental issues encompassing social, environmental, and climate justice; the impacts of climate change; the political and governance dimensions of responses to these changes; and social issues such as citizenship, inequality, and the mobilization of social movements.

A wide variety of methodological methods and procedures have been employed in climate justice research, including interviews, content analysis, systematic literature reviews, case studies, public policy analysis, document analysis, and discourse analysis, among others. Most studies adopt a multifaceted approach to data collection, combining various research techniques and methods. In qualitative approaches, research subjects range from individual activists to social

movements and populations directly affected by the effects of climate change. Studies on climate justice encompass a variety of temporalities and research contexts, reflecting the global and interconnected nature of these issues. Data collection covered a broad time span, from 2007 to 2023, with different study durations ranging from 1 month to 6 years.

The presence of the three fundamental aspects of climate justice – distributive, procedural, and recognition – was observed in most studies, highlighting the importance of an integrated approach to addressing climate challenges in a more equitable and sustainable manner. This SLR highlights the need for an interdisciplinary and holistic approach to addressing issues related to climate change and climate justice, emphasizing the importance of filling knowledge gaps identified in the existing literature and promoting greater awareness and action on climate justice.

This study allowed for a deeper reflection on the challenges and opportunities presented by climate justice research. The results revealed a predominance of studies conducted in the Global North, pointing to a significant underrepresentation of voices from the Global South. This gap highlighted the urgent need to include local perspectives and experiences of communities directly impacted by climate change, which often face the greatest inequalities in access to resources and decision-making. Therefore, it is essential to broaden the debate on the practical implications of the gaps identified, especially with regard to the production of action-oriented knowledge. This includes promoting collaborations between researchers, communities, and

policymakers to develop qualitative methodological approaches that are not only robust but also transformative. These aspects reinforce the importance of an integrated and critical view of climate justice that transcends academic boundaries and contributes effectively to ensuring truly equitable climate governance.

Some limitations of this review can be pointed out. To avoid bias, a systematic review is usually conducted by at least two researchers. This collaborative process was not feasible in this review, and it is important to acknowledge this limitation transparently, as it may impact the robustness of the review process and the reliability of its results. However, efforts were made to minimize potential biases through the adoption of detailed methodological documentation and strict adherence to review protocols. Another limitation was the exclusion of gray literature, such as technical reports and unpublished theses, due to time and access restrictions. This exclusion limited the analysis performed, as these sources contain practical information and specific data that are often not available in formal academic articles. On issues such as climate justice, this literature brings local and emerging perspectives, with contributions from directly affected communities. Without this material, the analysis may be partial, focused on formal publications and less representative of the diversity and current nature of the issues. Thus, the absence of gray literature reduces the depth of interpretation and limits the applicability of results in inclusive policies and practices.

Another limitation of this review is that the research focuses on qualitative methodol-

ogies. The problem related to the indexing of qualitative research in electronic databases is widely documented, with several explanations for this phenomenon being presented (Cooke *et al.*, 2012). A recurring suggestion is that the indexing of articles in most databases does not occur in accordance with the research methodology. This issue poses a significant challenge for researchers, especially when their research questions are centered on a specific methodology. The complexity of this indexing problem can be exacerbated by research articles that adopt vague titles, unstructured abstracts, and an inadequate definition of qualitative methodology (Cooke *et al.*, 2012).

The intention of this SLR was to contribute to the documentation and guidance of future academic research on the subject. Recommendations for future systematic reviews include conducting the review process with more than one researcher to improve the robustness and objectivity of the study. Collaboration between researchers, by involving different perspectives and approaches, can enrich critical analysis and validation of the results obtained. Furthermore, it is suggested that future investigations explore the inclusion of gray literature. The incorporation of this variety of sources can provide a more comprehensive view of the academic landscape, enriching the evidence base and potentially broadening understanding of the topic at hand. Additionally, it is recommended that future studies delve deeper into the approaches used to investigate climate justice issues, analyzing not only their effectiveness but also their limitations. This critical reflection can provide important insights

for methodological improvement.

This study offers preliminary insights into the state of knowledge and which qualitative methodologies are being used to research climate justice. Another dimension that deserves attention in future studies is the deepening of procedural justice, with the exploration of practical examples that illustrate how inclusive and transparent processes are (or are not) being implemented in the revisited studies. These considerations may contribute to strengthening both the applicability and relevance of investigations in the field.

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