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CLIMATE JUSTICE AND JUST TRANSITION: A SCOPING REVIEW OF THE USE OF THE CONCEPTS IN BRAZIL

JUSTIÇA CLIMÁTICA E TRANSIÇÃO JUSTA: UMA REVISÃO DE ESCOPO DO USO DOS CONCEITOS NO BRASIL

JUSTICIA CLIMÁTICA Y TRANSICIÓN JUSTA: UNA REVISIÓN DE ALCANCE DEL USO DE LOS CONCEPTOS EN BRASIL

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ABSTRACT: This article conducts a scoping review on the mobilization and application of the concepts of climate justice and just transition in the Brazilian scientific and technical literature from 2015 to 2024. The review is relevant given the current climate crisis and advances in public policies, such as the National Climate Change Plan (Plano Clima) and the Ecological Transformation Plan. The document selection included texts in Portuguese and English focusing on Brazil. The methodology followed six stages: defining the question, search strategy, screening, eligibility criteria, analytical coding, and integrated analysis, using bibliometric techniques. The results indicate that climate justice has been widely mobilized as a comprehensive concept, including topics such as just transition, climate adaptation, historical inequalities, gender, race, and the relevance of vulnerable populations. Despite the limitations, this article contributes to mapping the use of these concepts in Brazil, highlighting how they have been mobilized and applied in the country.

KEYWORDS: Climate change. Climate justice. Just transition. Scoping review. Social justice.

***RESUMO**: Este artigo realiza uma revisão de escopo sobre a mobilização e aplicação dos conceitos de justiça climática e transição justa na literatura científica e técnica brasileira entre 2015 e 2024. A revisão é relevante diante da crise climática atual e dos avanços em políticas públicas, como o Plano Nacional sobre Mudança do Clima (Plano Clima) e o Plano de Transformação Ecológica. A seleção de documentos incluiu textos em português e inglês com foco no Brasil. A metodologia seguiu seis etapas: definição da pergunta, estratégia de busca, triagem, critérios de elegibilidade, codificação analítica e análise integrada, utilizando técnicas bibliométricas. Os resultados indicam que a justiça climática tem sido amplamente mobilizada como um conceito abrangente, incluindo temas como transição justa, adaptação climática, desigualdades históricas, gênero, raça e a relevância das populações vulneráveis. Mesmo com limitações, este artigo contribui ao mapear o uso desses conceitos no Brasil, evidenciando como vêm sendo mobilizados e aplicados no país.*

***PALAVRAS-CHAVE**: Mudança climática. Justiça climática. Transição justa. Revisão de escopo. Justiça social.*

***RESUMEN**: Este artículo realiza una revisión de alcance sobre la movilización y aplicación de los conceptos de justicia climática y transición justa en la literatura científica y técnica brasileña entre 2015 y 2024. La revisión es relevante ante la crisis climática actual y los avances en políticas públicas, como el Plan Nacional sobre el Cambio Climático (Plan Clima) y el Plan de Transformación Ecológica. Se incluyeron textos en portugués e inglés con enfoque en Brasil. La metodología siguió seis etapas: definición de la pregunta, estrategia de búsqueda, selección, criterios de elegibilidad, codificación analítica y análisis integrado, utilizando técnicas bibliométricas. Los resultados indican que la justicia climática ha sido ampliamente movilizada como un concepto integral, abarcando temas como la transición justa, la adaptación climática, las desigualdades históricas, el género, la raza y la relevancia de las poblaciones vulnerables. A pesar de las limitaciones, este artículo contribuye al mapeo del uso de estos conceptos en Brasil, evidenciando cómo se han movilizado y aplicado en el país.*

***PALABRAS CLAVE**: Cambio climático. Justicia climática. Transición justa. Revisión de alcance. Justicia social.*

Introduction

As highlighted in the report *"Climate Change in Brazil: Updated Synthesis and Perspectives for Strategic Decision-Making,"* prepared by the Ministério da Ciência, Tecnologia e Inovação (MCTI) (2025), the socioeconomic impacts associated with climate change are concentrated in highly vulnerable communities. The floods that affected the state of Rio Grande do Sul exemplify this pattern, demonstrating how structural inequalities—particularly racial and socioeconomic disparities—disproportionately affect Black and low-income communities, as evidenced by maps produced by the Observatório das Metrópoles (2025)[6]. In other words, climate impacts reinforce preexisting socioeconomic inequalities.

In this context, reducing vulnerability to climate change is indispensable for achieving climate justice and enabling just transitions (Birkmann *et al.*, 2022). It is within this framework that the concepts of climate justice and just transition have gained increasing prominence.

Climate justice is increasingly recognized as a key principle within mitigation and adaptation strategies and projects (Birkmann *et al*., 2022). It derives from the concept of environmental justice[7], coined between the 1960s and 1970s, and is also referenced in the preamble of the Paris Agreement, adopted in 2015 within the framework of the United Nations Framework Convention on Climate Change (UNFCCC). The concept underscores the disproportionate impacts of climate change on specific social groups and proposes that the crisis be addressed through the principle of historical and differentiated responsibility of major emitters, alongside the protection of the most vulnerable (Acselrad; Mello; Bezerra, 2009; Borràs, 2016; Jacobi; Arruda Filho; Pierro, 2022).

In Brazil, its application requires recognizing intersectional oppressions that exacerbate climate vulnerability—particularly among Black, Indigenous, quilombola, and peripheral women—and advocates overcoming colonial legacies, the exclusion of traditional knowledge systems, and extractivist dependency (Guevara-Cue, 2025). Brazilian academia and civil society have increasingly incorporated the concept of climate justice into public policy debates,

[6] To access the maps, see more at: https://www.observatoriodasmetropoles.net.br/nucleo-porto-alegre-analisa-os-impactos-das-enchentes-na-populacao-pobre-e-negra-do-rio-grande-dosul/?utm_source=Boletim&utm_medium=Email&utm_campaign=835&utm_content=Núcleo+Porto+Alegre+analyzes+the+impacts+of+flooding+on+the+poor+and+black+population+of+Rio+Grande+do+Sul. Accessed on: Jan. 30, 2026.

[7] Authors such as Schlosberg *et al*. (2014) in "From environmental to climate justice: climate change and the discourse of environmental justice" argue that the concept of environmental justice may have given rise to the climate justice movement, which in turn supported the configuration of the concept of just transition.

employing it more frequently in recent years (Belmont, 2023; Louback; Lima, 2022; Maluf *et al.*, 2022; Torres *et al*., 2020; Travassos *et al*., 2021).

Another equally important concept is that of just transition, which originated in trade union mobilizations in the United States during the 1980s and 1990s in response to job losses resulting from pollution control legislation (Stark; Gale; Murphy-Gregory, 2023). Similar to climate justice, just transition is also referenced in the Paris Agreement (UNFCCC, 2015).

The concept describes the shift from an economic and social model based on high carbon emissions and pollution toward a more sustainable, low-carbon model, ensuring that this transformation is carried out inclusively. Just transition has been applied in initiatives such as the European Green Deal and the Green New Deal in the United States, and has gained prominence through the Just Transition Work Programme (JTWP), established at the 27th Conference of the Parties to the UNFCCC, which reaffirmed support for integrating climate goals with social and economic development, labor rights, and social protection (UNFCCC, 2023).

In Brazil, although discussions on climate change have advanced and the issue has become increasingly embedded in strategic public policies—such as the National Climate Change Plan (Plano Clima) and the Ecological Transformation Plan—there remains a need to expand research efforts on the concepts of climate justice and just transition. This need is justified by historical inequalities in access to land, rights, formal employment, and social protection, as identified in national literature, as well as by the urgency of increasingly frequent and intense extreme climate events (MCTI, 2025).

Accordingly, it is essential to deepen understanding of the main sources and approaches to these concepts, taking into account national specificities. To assess the state of the art in Brazil regarding their use, the central research question of this study is: how have the concepts of climate justice and just transition been mobilized and applied in the Brazilian literature?

To address this question, a scoping review was conducted to map and critically analyze how these concepts have been discussed and applied in academic and technical literature between 2015 and the present (2024). The year 2015 was selected as the starting point because it marked the consolidation of international recognition of climate justice and just transition through the adoption of the Paris Agreement (UNFCCC, 2015), which entered into force in 2016. The methodology followed six stages: (i) definition of the research question; (ii) development of a search strategy using Boolean operators applied to academic ("white") and technical ("gray") literature databases; (iii) initial screening of documents; (iv) application of

eligibility criteria (temporal, thematic, territorial, and conceptual); (v) coding into an analytical matrix; and (vi) integrated analysis supported by bibliometric tools.

Although limited by the databases consulted and by criteria such as the selection of the Paris Agreement as the temporal landmark and the language of the documents, the results suggest that climate justice functions as an overarching "umbrella" principle, articulating other research fields currently prominent among scholars in Brazil. Just transition, in contrast, appears more narrowly connected—particularly to private-sector decarbonization strategies. The sample of analyzed works indicates a complementary use of the two concepts, with climate justice serving as the primary analytical axis driving the discussion in Brazil.

This article is structured into five sections, the first being this introduction. The second section describes the adopted methodology. The third section presents bibliometric results for the set of academic articles only. The fourth section analyzes how academic and technical texts mobilize and apply the concepts of just transition and climate justice, while also offering a synthetic effort to articulate their potential interconnections. Finally, the fifth section presents the conclusions.

Methodology

Scoping reviews constitute valuable instruments for synthesizing evidence and assessing the state of the art on a given topic, as emphasized by Tricco *et al*. (2018). The choice of this type of review was guided by the recommendations of Munn *et al*. (2018) and the decision tree developed by the University of Maryland (2022). The latter recommends a scoping review when: (i) the topic is broad; (ii) sufficient time and personnel are available to conduct screening; and (iii) the objective is not to critically appraise study quality, but rather to map the conceptual and analytical terrain. These conditions were met in the present study.

To conduct the scoping review, six stages were structured, as described in Table 1, following an adapted methodological protocol appropriate for this type of review (see the aforementioned references). The methodology aimed to answer the following question: how have the concepts of climate justice and just transition been mobilized and applied in the Brazilian literature? The focus on Brazil reflects the intention to capture approaches that address the country's specific social, economic, and climatic contexts.

Table 1 – Sequential Stages of the Scoping Review

Stages	Description
Stage 1 – Definition of the research question	Formulation of the research question based on an exploratory literature review, aimed at defining the thematic scope and objectives of the review.
Stage 2 – Development of the search strategy and inclusion/exclusion criteria	Construction of the search strategy, including the identification of descriptors and semantic terms, as well as the definition of inclusion and exclusion criteria for the scoping review.
Stage 3 – Mapping	Mapping of scientific databases and institutional sources for the collection of relevant academic articles and technical documents.
Stage 4 – Screening and selection	Screening and selection of studies based on the reading of titles and abstracts, applying the defined criteria through successive filtering stages.
Stage 5 – Coding and data extraction	Coding and data extraction from selected studies using a structured analytical matrix based on previously defined fields.
Stage 6 – Data analysis and synthesis of results	Data analysis and synthesis of findings, including relevant metadata, non-exhaustive thematic categorization, and preparation of the final review report.

Source: Prepared by the authors (2024).

Stage 1: Definition of the Research Question

Stage 1 consisted of conducting an exploratory review of the academic literature. This phase aimed to analyze review articles addressing the themes of climate justice and just transition—though not necessarily within the Brazilian context. Studies such as those by Stark, Gale, and Murphy Gregory (2023) and Alves and Mariano (2018) were selected for their breadth, methodological rigor, and conceptual relevance, providing an initial foundation for understanding the concepts. These works supported the formulation of the research question, which was defined as follows: How have the concepts of climate justice and just transition been mobilized and applied in the literature within the Brazilian context?

Stage 2: Development of the Search Strategy and Inclusion/Exclusion Criteria

Stage 2 involved the formulation of the search strategy, that is, the definition of descriptors and semantic terms and the establishment of eligibility criteria for document selection. The following subsections detail the development of the strategy and the inclusion and exclusion criteria adopted for the database construction.

Search Strategy, Descriptors, Semantic Terms, and Databases

The search strategy was constructed through the combination of key terms related to the study's core concepts, identified during Stage 1, using the basic Boolean operators "AND," "OR," and "AND NOT." The selected keywords were "climate justice," "just transition," and "environmental justice," the latter incorporated due to its historical and formative relevance to the first two concepts, as discussed in the introduction.

To collect academic literature, searches were conducted in three bibliographic databases—Web of Science, Scopus, and EBSCOhost—chosen for their broad interdisciplinary coverage, their recognition as consolidated references for high-quality reviews, and their inclusion of peer-reviewed publications.

For the collection of gray literature, the Bielefeld Academic Search Engine (BASE) platform was used, given its flexibility in integrating results from academic, institutional, and global repository sources, thereby broadening the scope beyond conventional academic production such as theses and dissertations. Manual searches complemented this effort, enabling the identification of technical reports, policy briefs, and documents produced by social movements and civil society organizations—materials often absent from traditional databases but essential for understanding the practical dimensions surrounding these concepts in Brazil.

Google Scholar was deliberately excluded from the search for academic (white) literature due to the lack of advanced filtering tools, variable quality standards, and frequent access limitations, as many articles were behind paywalls or required subscription.

The search strings applied in the aforementioned databases are presented in Table 2 below.

Table 2 – Semantic Descriptors by Database

Database	Semantic component
Web of Science	TS=(“Just Transition*” OR “Transição Justa*” OR “Climate Justice*” OR “Justiça Climática*” OR “Environmental Justice*” OR “Justiça ambiental*”) AND TS=(“Climat*” OR “Clim*”) AND TS=(“Brazil*” OR "Brasil*")
Scopus	TITLE-ABS-KEY("Just Transition*" OR "Transição Justa*" OR "Climate Justice*" OR "Justiça Climática*" OR "Environmental Justice*" OR "Justiça ambiental*") AND TITLE-ABS-KEY("Climat*" OR "Clim*") AND TITLE-ABS-KEY("Brazil*" OR "Brasil*")
EBSCOhost	("Just Transition*" OR "Transição Justa*" OR "Climate Justice*" OR "Justiça Climática*" OR "Environmental Justice*" OR "Justiça ambiental*") AND ("Climat*" OR "Clim*") AND ("Brazil*" OR "Brasil*")
BASE	“Justiça Climática” AND “Racismo Ambiental” OR “Justiça Climática” AND “Racismo Ambiental” OR “Justiça Climática” AND “Racismo Ambiental” OR “Transição Justa” AND “Justiça Climática” OR “Transição Justa” AND “Justiça Climática” OR “Transição Justa”
Pesquisa manual	Documentos da UNFCCC, movimentos sociais, ONGs, institutos de pesquisa, fundações, governos e empresas

Source: Prepared by the authors (2024).

Definition of Eligibility Criteria

To ensure analytical consistency and thematic relevance of the collected materials, five eligibility criteria were established for inclusion.

I. **Criterion 1: Timeframe (2015–2024)**: The selected timeframe begins in 2015—the year of the adoption of the Paris Agreement—which, for the first time, formally enshrined the need to pursue a “just transition” toward a low-carbon economy and recognized “climate justice” as a guiding principle in addressing climate change (UNFCCC, 2015). This milestone is justified both by its historical significance and by its normative and political impact on global and national climate agendas. The year 2024 marks the endpoint of eligibility, as it corresponds to the period during which this research was conducted.

II. **Criterion 2: Climate and conceptual focus**: Only studies that explicitly address the relationship between climate justice or just transition and the phenomenon of climate change were included. This delimitation ensures thematic alignment with the research object and excludes generic approaches or those disconnected from the climate field. Accordingly, materials retrieved through the historically complementary keyword “environmental justice” were analyzed through the specific climate and conceptual lens adopted in this scoping review.;

III. **Criterion 3: Geographic focus on Brazil**: Given that the objective of this scoping review is to understand the specific contours these concepts assume within the Brazilian context, selected documents directly address Brazil's social, environmental, and institutional realities.

IV. **Criterion 4: Language (Portuguese or English)**: Only documents published in Portuguese or English were considered, as these are the most widely used languages in Brazilian and international academic and institutional contexts, without compromising source diversity or comprehension.

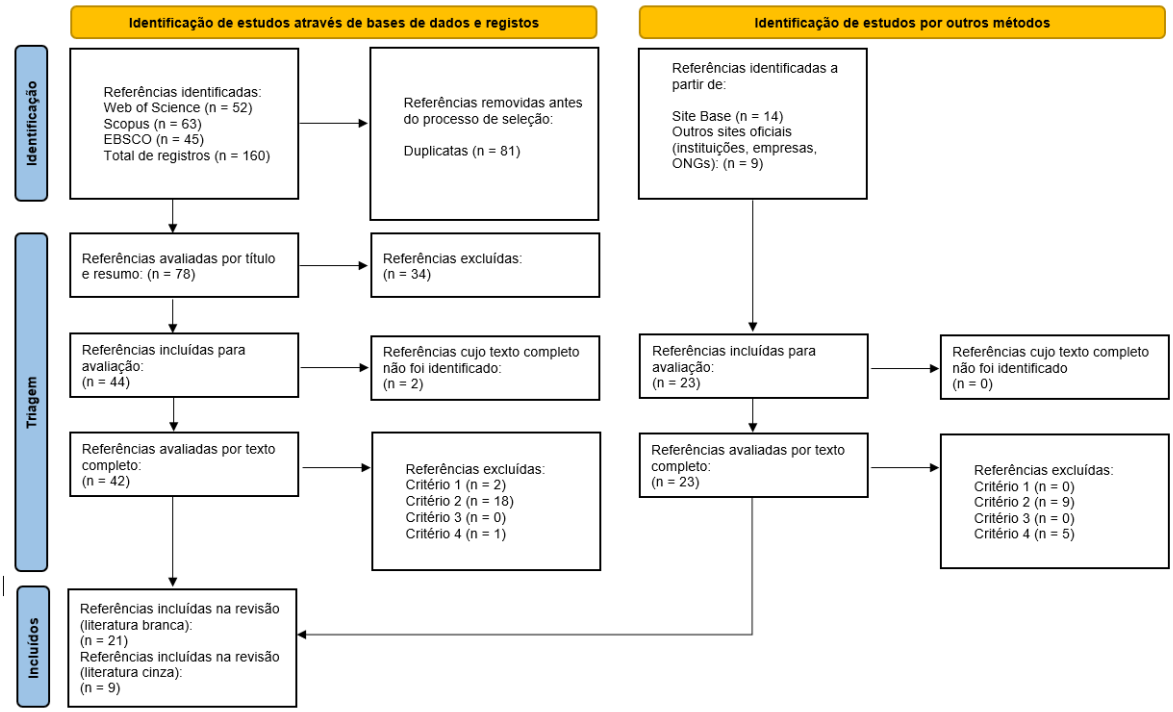
Exclusion criteria were defined analogously, consisting of the absence of any of the inclusion criteria described above. The symmetrical application of inclusion and exclusion criteria ensured methodological coherence, guaranteeing that only studies relevant to the objectives of the review were selected.

Etapa 3: mapeamento

Once the search and inclusion criteria had been established (Stage 2), the search and screening of documents in the selected databases began. Figure 1 below schematically represents this process through a simplified PRISMA flow diagram[8] described in Stages 3 and 4. The PRISMA Flow Diagram (Page *et al*., 2021) is not a mandatory protocol for scoping reviews, but it is strongly recommended.

[8] For this scoping review, the PRISMA 2020 Checklist was not used; only the PRISMA 2020 Flow was used, which is available at: https://www.prisma-statement.org/prisma-2020-flow-diagram. Accessed on: Jan. 30, 2026.

Figure 1 – PRISMA Flow Diagram of the Scoping Review



Source: Prepared by the authors (2024). Adapted from Page *et al*. (2021).

Stage 3, corresponding to the "Identification" section of the PRISMA flow (see Figure 1), comprised the search for documents in both academic (white) and gray literature databases.

The initial collection of academic literature involved automated searches in the Web of Science, Scopus, and EBSCOhost databases, as well as on the BASE platform. The identification process initially yielded 160 records from bibliographic databases. To ensure sample quality, 81 duplicate records were removed through automated filters and manual verification, resulting in a total of 78 unique documents that proceeded to the screening phase.

In the field of gray literature, a manual search was conducted on the websites of civil society organizations, foundations, companies, government bodies, and international organizations. A total of 23 documents were identified, 14 of which were located through repositories such as BASE and 9 through various organizational websites, as illustrated in Figure 1.

Stage 4: Screening and Selection

In Stage 4, document screening was conducted through a progressive exclusion process, in accordance with the previously defined eligibility criteria, as described in the section "Definition of Eligibility Criteria." Additionally, a small number of relevant documents not previously identified were incorporated. This process is graphically represented in Figure 1—specifically in the "Screening" and "Included" sections.

The first screening phase of the academic (white) literature consisted of reviewing titles and abstracts using the Rayyan software[9]. This stage resulted in the exclusion of 34 academic studies that addressed exclusively environmental justice, without articulation with climate justice or just transition. The process was carried out by two independent reviewers, with the support of a third reviewer responsible for resolving disagreements and validating decisions. The remaining 44 academic studies proceeded to full-text review, except for two that could not be accessed.

In the subsequent stage of screening, the 42 accessible academic studies were evaluated in full. This process was conducted by three reviewers, all of whom are authors of this article. Following full-text reading, 21 academic studies were excluded for failing to meet the eligibility criteria outlined in the relevant section. It is noteworthy that exclusion criteria 1, 2, 3, and 4 highlighted in the PRISMA flow correspond directly to eligibility criteria 1, 2, 3, and 4. The reasons for exclusion were as follows: publication outside the defined timeframe (Criterion 1, n = 2); absence of a climate and conceptual focus (Criterion 2, n = 18); and non-compliance with the predefined language criteria (Criterion 4, n = 1). Consequently, 21 academic studies were retained as the final corpus of academic literature.

In parallel, the 23 technical (gray literature) documents were also subjected to screening. No exclusions were made due to duplication or inaccessibility. After reviewing titles and content, 15 technical documents were excluded, primarily due to the absence of a climate and conceptual focus (Criterion 2, n = 9) and non-compliance with the predefined language criteria (Criterion 4, n = 5). Thus, 8 technical documents remained for subsequent analysis.

In total, at the conclusion of the screening process, 21 academic studies and 9 technical documents were selected for this scoping review, resulting in a final corpus of 30 documents to be fully analyzed (see Table 3).

[9] For more information about the software, see: OUZZANI, M. *et al*. Rayyan: a web and mobile app for systematic reviews. Systematic Reviews, v. 5, n. 1, p. 210, 2016. Available at: https://www.rayyan.ai/cite. Accessed on: July 19, 2025.

Table 3 – References Used, by Author(s), Title, Type of Publication, and Year

Author(s)	Year	Title	Source	Type of publication
Bastos Lima	2022	Just transition towards a bioeconomy: Four dimensions in Brazil, India, and Indonesia	Forest Policy and Economics	White literature (academic)
Borràs	2016	Movimientos para la justicia climática global: replanteando el escenario internacional del cambio climático	Relaciones Internacionales	White literature (academic)
Carmenta *et al.*	2021	Between a rock and a hard place: The burdens of uncontrolled fire for smallholders across the tropics	World Development	White literature (academic)
Carvalho, González Del Campo e Cabral	2022	Scales of inequality: The role of spatial extent in environmental justice analysis	Landscape and Urban Planning	White literature (academic)
Cavalcanti *et al.*	2022	Movimentos sociais na ocupação de imóveis vazios nas áreas centrais e o enfrentamento inclusivo das mudanças climáticas: Os casos de São Paulo e Natal	Revista Direito e Cidadania	White literature (academic)
Du Pont *et al.*	2016	National contributions for decarbonizing the world economy in line with the G7 agreement	Environmental Research Letters	White literature (academic)
Furlan e Mariano	2021	Guiding the nations through fair low-carbon economy cycles: A climate justice index proposal	Ecological Indicators	White literature (academic)
Gil, Marques, e Andrade	2023	Agenda climática e o turismo no Brasil: Contribuições para políticas públicas de adaptação frente às mudanças climáticas	RBTUR	White literature (academic)
Jacobi, Arruda Filho e Pierro	2022	Ambiente e sociedade em tempos de emergência climática: Do resgate histórico ao momento atual	Fronteiras	White literature (academic)
Jafry, Helwig e Mikulewicz (Ed.)	2019	Routledge handbook of climate justice	Routledge	White literature (academic)
Kaufmann, Seidel e Stößel	2016	The climatological environmental justice index—Brazil, Canada, and Germany	Environmental Justice	White literature (academic)
Maluf *et al.*	2023	Global value chains, food, and just transition: A multi-scale approach to Brazilian soy value chains	The Journal of Peasant Studies	White literature (academic)
Maluf *et al.*	2022	Sustainability, justice, and equity in food systems: Ideas and proposals in dispute in Brazil	Environmental Innovation and Societal Transitions	White literature (academic)

Milani e Chaves	2022	How and why European and Chinese pro-climate leadership may be challenged by their strategic economic interests in Brazil	Asia Europe Journal	White literature (academic)
Milanez, Menton e Souza	2022	Epistemological justice: Decoloniality, climate change, and ecological conditions for future generations	IDS Bulletin	White literature (academic)
MMA	2016	Plano Nacional de Adaptação à Mudança do Clima: Sumário executivo	Ministério de Meio Ambiente e Mudança do Clima (MMA)	Gray literature (technical)
Moretti *et al.*	2024	Occupation of vacant buildings in central districts by social movements as a means to deal with climate change in an inclusive way	Environment & Urbanization	White literature (academic)
Rolleston *et al.*	2023	Aiming higher? Implications for higher education of students' views on education for climate justice	Sustainability	White literature (academic)
Seleguim	2021	How do community responses from the global south contribute to the climate justice and resilience debate?	Ambiente & Sociedade	White literature (academic)
Torres *et al.*	2020	Is the Brazilian National Climate Change Adaptation Plan addressing inequality?	Environmental Justice	White literature (academic)
Travassos *et al.*	2021	Why do extreme events still kill in the São Paulo Macro Metropolis Region?	International Journal of Urban Sustainable Development	White literature (academic)
ZAPE	2023	A gender perspective on Brazilian state laws addressing climate change	Brazilian Political Science Review	White literature (academic)
UNFCCC	2015	Paris Climate Change Conference - November 2015: COP21 Paris Agreement	United Nations Framework Convention on Climate Change (Convenção-Quadro das Nações Unidas sobre a Mudança do Clima)	Gray literature (technical)
Engie Brasil Energia	2024	Desafios da transição energética são destaque em ENGIE Day - ENGIE Brasil	Site da empresa Engie	Gray literature (technical)
Petrobrás	2024	Plano Estratégico 2024 -2028+	Site da empresa Petrobras	Gray literature (technical)
Instituto de Referência Negra Peregum	2023	Racismo Ambiental e Emergências Climáticas no Brasil	Site do Instituto Peregum	Gray literature (technical)
Ministério do Meio Ambiente	2024	Plano Clima	Site do Ministério do Meio Ambiente	Gray literature (technical)
Centro Brasileiro de Justiça Climática	2020	O paradoxo da justiça climática no Brasil: o que é e para quem?	Site do Centro Brasileiro de Justiça Climática	Gray literature (technical)

Plataforma de Transição Justa	2024	Plataforma de transição justa	Site da Plataforma de Transição Justa	Gray literature (technical)
Rede Brasileira de Justiça Ambiental	2024	Da transição energética à transição ecológica: a contribuição da justiça ambiental e um convite ao debate	transicao_energetica_ecologica-VF.pdf	Gray literature (technical)

Source: Prepared by the authors (2024).

Stage 5: Coding and Data Extraction

Stage 5 consisted of coding the selected documents in order to systematize the identified evidence. To this end, a coding matrix was developed for data extraction, with the primary objective of organizing, standardizing, and ensuring coherence in the data in line with the objectives of this review (see Table 4).

Table 4 – Matrix for Coding and Analysis of Selected Documents

Category	Field
Bibliographic information	Authors; authors' gender; title; DOI; year of publication.
Analytical framing	Study objective; thematic area; research object; sector of activity.
Conceptual dimensions	Does it define Just Transition (JT)?; definition of JT; does it define Climate Justice (CJ)?; definition of CJ; does it define Environmental Justice (EJ)?; definition of EJ.
Methodological approach	Type of methodological procedure (qualitative, quantitative, or mixed); brief description of the methodology employed.
Results and limitations	Summary conclusion; declared limitations.
Eligibility and observations	Indication of exclusion (Yes/No); reason for exclusion (Criteria 1, 2, or 3); record of inaccessible articles; additional observations.

Source: Prepared by the authors (2024).

Data were extracted from the 30 selected documents in accordance with the structure presented in Table 4. This process was conducted over a two-month period by a team composed of two male and two female researchers, with the aim of ensuring diversity of perspectives in the analysis of the sources.

Stage 6: Data Analysis and Synthesis of Results

Finally, in Stage 6, the data were organized into an XLSX-format database, recording the extracted metadata for each document. The analysis was then conducted primarily to address the following questions: What are climate justice and just transition, and how are these concepts mobilized and applied, among other related aspects?

The data analysis did not follow a formal qualitative content analysis approach; rather, it was structured according to the fields presented in Table 3. Based on the resulting database, it was possible to identify how the concepts are mobilized and applied and to develop—albeit in a limited manner—a final synthesis of the findings, which forms part of this article's Discussion chapter.

Bibliometric Results

Bibliometric results are presented for the academic (white) literature, as metadata were not available for the gray literature. Table 5 provides data on the publication sources of the academic literature.

Although limited to the 21 selected articles, it was possible to identify a predominance of publications in interdisciplinary journals (15). This finding highlights the still transversal nature of the analyzed concepts and the thematic fields to which they are connected. The remaining journals are associated with specific disciplinary areas. Among these are the Brazilian Political Science Review (political science), Ecological Indicators (ecology and environmental sciences), Forest Policy and Economics (forest policy), Revista Brasileira de Pesquisa em Turismo (tourism and management), and Revista de Direito da Cidade (urban and environmental law). The only journal with two articles in the sample was Environmental Justice. Overall, these titles—particularly the five area-specific journals—also point to the interdisciplinary character of the themes under examination.

Regarding CAPES-QUALIS—the Brazilian system for evaluating the quality of scientific publications—11 of the selected articles are classified as A1 (highest rating, high quality) or A2 (good quality). In general, this indicates that the themes of climate justice and just transition are being disseminated through relevant academic forums with the potential to influence scientific debate.

Table 5 – Bibliometric results

Number of articles	Journal	Field	Capes-qualis
2	Environmental Justice	Interdisciplinary	A1 or A2
1	Asia Europe Journal	Interdisciplinary	-
1	Brazilian Political Science Review	Political Science and International Relations	A1
1	Ecological Indicators	Ecology and Environmental Sciences	A1 or A2
1	Environment & Urbanization	Interdisciplinary	A1 or A2
1	Environmental Innovation and Societal Transitions	Interdisciplinary	A1
1	Environmental Research Letters	Interdisciplinary	A1
1	Estudos Avançados	Interdisciplinary	C
1	Forest Policy and Economics	Forest Policy and Economics	A1 or A2
1	Fronteiras: Journal of Social	Interdisciplinary	A4

1	IDS Bulletin-Institute of Development Studies	Interdisciplinary	A1
1	International Journal of Urban Sustainable Development	Interdisciplinary	A1
1	Journal of Human Development and Capabilities	Interdisciplinary	A2 or B1
1	Landscape and Urban Planning	Interdisciplinary	A1
1	Revista Brasileira de Pesquisa em Turismo	Tourism	A3
1	Revista de Direito da Cidade	Urban and Environmental Law	A2 and B2
1	Sustainability	Interdisciplinary	A2 and B1
1	Technological and Evironmental Science	Interdisciplinary	A4
1	The Journal of Climate Change and Health	Interdisciplinary	A1
1	The Journal of peasant studies	Interdisciplinary	A1
Total = 20	-	-	-

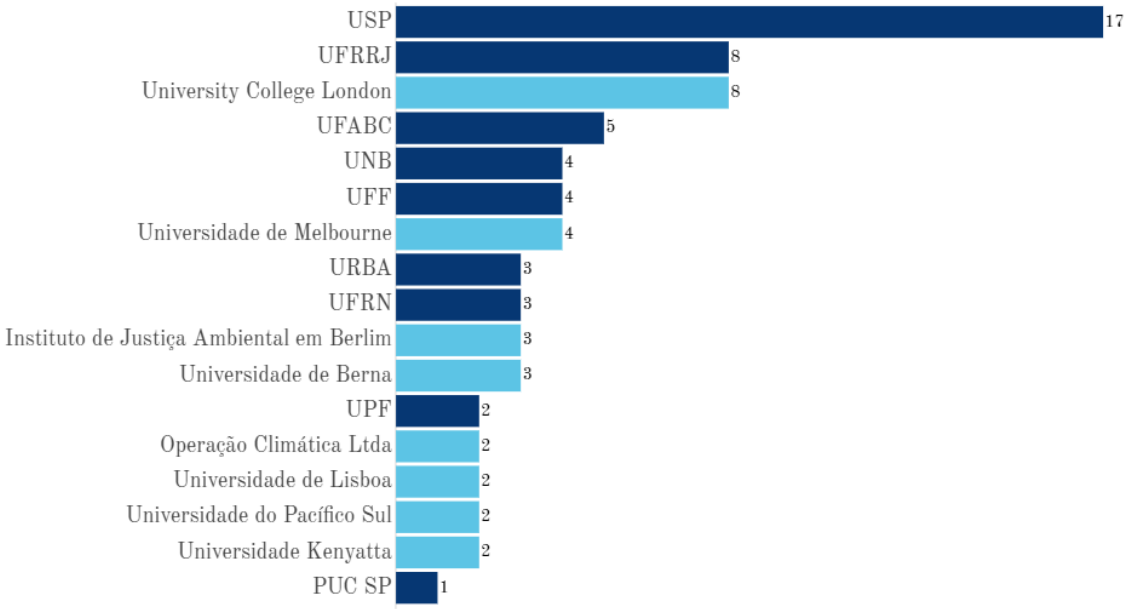
Source: Prepared by the authors (2024).

When examined from the perspective of institutional affiliations (see Figure 2), the data reveal broad institutional diversity, encompassing universities and research centers both in Brazil and abroad.

At the national level, the Universidade de São Paulo (USP) stands out as the most frequent institutional affiliation, with 17 affiliated authors, followed by the Universidade Federal Rural do Rio de Janeiro (UFRRJ), with eight authors, and the Universidade Federal do ABC (UFABC), with five authors. Internationally, University College London (UCL) also stands out, contributing eight authors. Overall, the results highlight the prominent role of national scientific production on the topic, with a total of 45 authors affiliated with Brazilian institutions[10].

[10] For this calculation, the affiliations shown in Figure 3 were considered.

Figure 2 – Main Institutional Affiliations of Author-Researchers from National and International Teaching and Research Institutions



Source: Prepared by the authors (2024).
Note: Sixteen additional national and international affiliations were recorded, each represented by one author, including the Universidade Federal do Rio de Janeiro (UFRJ), Universidade Estadual de Campinas (UNICAMP), Universidade Estadual Paulista (UNESP), Universidade Federal de Minas Gerais (UFMG), Universidade Federal do Pará (UFPA), Universidade Federal do Recôncavo da Bahia (UFRB), and Universidade do Estado do Rio de Janeiro (UERJ); the Stockholm Environment Institute; the ETH Zurich; the International Institute for Environment and Development; the Potsdam Institute for Climate Impact Research; Trinity College Dublin; the University of Cambridge; the University of East Anglia; and the Young Defenders of Climate Action Philippines.

Por Finally, Figure 3, based on 172 keywords, seeks to map the main research interests in climate justice and just transition in Brazil. The thematic map was created using the Bibliometrix package in RStudio and its Biblioshiny interface[11]. Figure 3 presents the results of keyword co-occurrence analysis. The size of the clusters—or research themes—reflects the frequency of term occurrence; thus, larger circles indicate keywords that appear more frequently in the analyzed literature (Cobo *et al*., 2011).

Clusters are structured and classified according to two dimensions: centrality, which refers to the importance of a theme in the development of the theoretical field—meaning that the more central the theme, the more relevant it is to the research area; and density, which refers to the internal cohesion of the words within a theme, that is, the degree to which the terms composing the theme are interconnected, forming a cohesive set (Cobo *et al*., 2011).

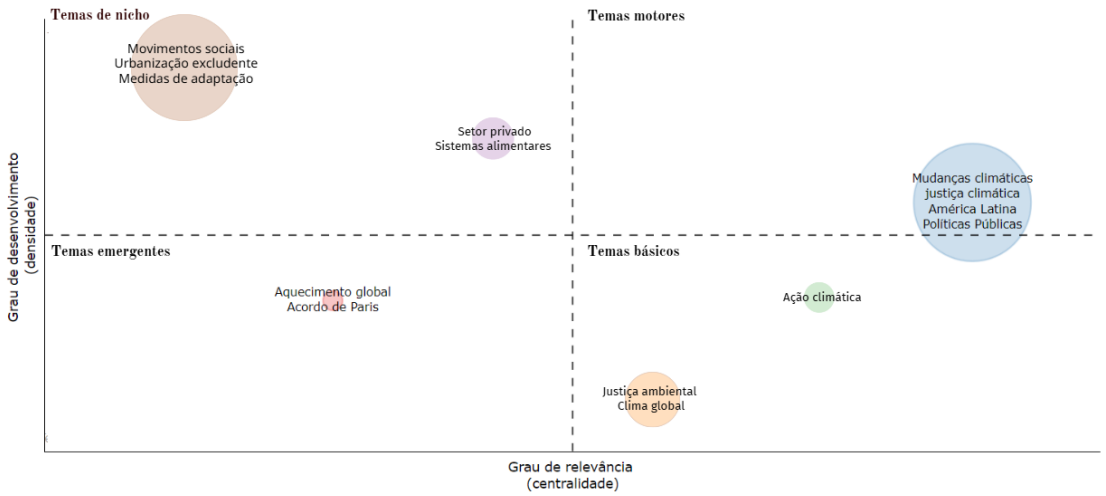
[11] See more at: https://bibliometrix.org/biblioshiny/biblioshiny1.html. Accessed on: July 19, 2025.

Acknowledging the limitations of the analyzed corpus, noteworthy findings emerge in the upper-right quadrant, which suggests that themes such as "Climate Change," "Latin America," "Climate Justice," and "Public Policy" constitute the highly central and densely interconnected core of the field. These themes are more frequently explored and appear to function as potential driving forces of the research area (Cobo *et al*.,2011).

"Environmental Justice," a precursor to the debate on climate justice and just transition (see Introduction), appears in the lower-right quadrant. It is classified as highly relevant but potentially characterized by lower internal density within this specific field of study, consistent with its historical roots (Cobo *et al*., 2011).

In the upper-left quadrant, which identifies specialized or "niche" themes, three high-density topics (Cobo *et al*., 2011) stand out among Brazilian researchers: "Social Movements," "Exclusionary Urbanization," and "Adaptation Measures."

Figure 3 – Keyword Co-occurrence



Source: Prepared by the authors (2024).

It is worth noting that the theme "Private Sector" also appears in the upper-left quadrant alongside specialized topics such as "Food Systems." Although identified as having high density and low centrality, private sector engagement—particularly through corporate initiatives related to just transition, as discussed below—emerges as a significant finding for the field, especially when considering the technical documents not included in this bibliometric analysis (Cobo *et al*., 2011).

Discussion

This section discusses the results of the scoping review process and primarily aims to present how the concepts of climate justice and just transition are being mobilized and applied in Brazilian academic and technical literature. It also offers a brief synthesis of potential thematic lines identified in the review, which, although limited by the scope of the analyzed corpus, may serve as inspiration for future research.

Mobilization and Application of the Concepts of Climate Justice and Just Transition

In the academic literature, as illustrated in Figure 4, climate justice emerges as the driving theme of the research field among the analyzed texts. Across the set of academic articles, authors such as Furlan and Mariano (2021) mobilize the concept to address complex moral and ethical issues related to adaptation and mitigation actions. In doing so, they incorporate the capabilities approach advanced by Klinsky *et al*. (2017), framing climate justice as central to human development and climate action. The concept is operationalized through the proposal of a climate justice index for 198 countries, categorized according to UNFCCC groupings, to analyze national development in the climate context while ensuring social well-being.

Kaufmann, Seidel, and Stößel (2016), in turn, understand climate justice as a concept that places issues of social justice at the center of climate change challenges, focusing on addressing structural inequalities and vulnerabilities. Based on this understanding, the authors develop an index that, unlike Alves (2020), combines social and climatological variables to assess vulnerability and identify regions and population groups affected by socio-environmental stressors. This index is used to design a model for climate change adaptation policies and has been applied to Brazil as well as to other countries.

For Du Pont *et al*. (2016), climate justice refers to the fair distribution of emission reductions among countries, taking into account factors such as capacity, equality, responsibility, and need. The aim is to ensure that the burden of emission reductions is shared equitably and that global climate targets are met. The concept is operationalized through different equity-based approaches and through a critical assessment of current national commitments, such as Nationally Determined Contributions (NDCs).

By contrast, authors such as Milanez *et al*. (2022) mobilize the concept of climate justice through Indigenous perspectives that critique the Anthropocene and the climate emergency. In this view, climate justice is linked to broader social and epistemological issues, emphasizing the need for epistemic justice. Indigenous imaginaries of future conditions inform present climate action, and climate justice is framed as part of a broader struggle against intersecting injustices embedded in capitalist systems.

Other authors, such as Maluf *et al*. (2022, 2023), address both concepts in an almost complementary manner. Climate justice is mobilized and applied in both texts through a multiscalar, justice-based approach to analyze Brazilian soybean value chains. This involves consideration of distributive, procedural, and recognitional justice—referred to as "recognition" in the 2023 publication—to highlight systemic threats to food and environmental justice. The articles criticize existing initiatives for failing to fully address climate justice, as they often focus on carbon neutrality without confronting broader social and environmental injustices. In turn, the concept of just transition is mobilized by focusing on the interconnection of food systems across multiple scales and applying the aforementioned justice dimensions to assess the feasibility and requirements for a just and sustainable transition within soybean value chains.

Bastos Lima (2022) situates climate justice within the broader framework of "sustainability transitions," focusing on energy poverty, the reduction of fossil fuel use, and the protection of vulnerable populations from climate change impacts. Climate justice is thus integrated into a just transition analytical model that includes distributive and procedural justice—similar to the approach adopted by Maluf *et al*. (2022, 2023)—with the addition of retributive and restorative justice. This model is applied to the bioeconomy, a key domain in which climate and energy debates intersect with land use and agriculture.

Articles published in fields related to the environment, urbanization, urban development, and landscape studies, such as those by Cavalcanti *et al*. (2022) and Moretti *et al.* (2024), also mobilize the concept of climate justice by highlighting issues of social justice associated with climate change—particularly in urbanization and housing. These works draw on social movements, especially in terms of their potential relevance for addressing inequality, vulnerability, and resilience in urban areas.

More specifically, Moretti *et al.* (2024) argue that movements advocating for the occupation of vacant buildings in central districts can promote social justice by providing housing for marginalized populations and influencing public policy. Moreover, these initiatives

align with the concept of just transition, as they help curb uncontrolled urban expansion and improve infrastructure, thereby contributing to more sustainable and inclusive urbanization. Similarly, Travassos *et al.* (2020) mobilize and apply only the concept of climate justice, prioritizing the needs of the poorest and most vulnerable populations in decision-making processes. They integrate the concept into territorial and anticipatory governance frameworks, while criticizing current policies for inadequately addressing adaptive governance and socio-environmental vulnerabilities.

Other authors publishing in interdisciplinary journals connect the concepts to an agenda related to education and climate. Rolleston *et al.* (2023) mobilize and apply the concept of climate justice to advocate for a paradigm shift toward an ecological worldview capable of engaging students in climate action. Based on this understanding, they discuss practical applications such as the Climate-U project, which presents results and recommendations aimed at improving teaching and learning about climate change and encouraging student participation in outreach activities. Rolleston *et al.* (2023), along with Nussey *et al.* (2022), Seleguim (2021), and Zape (2023), adopt a broader understanding of climate justice as involving recognition of the unequal impacts of climate change on marginalized and vulnerable groups who are disproportionately affected.

Still within the educational agenda, Huq *et al.* (2023) mobilize the concept of climate justice to develop an "Environmental Equity Educator's Guide for Climate Justice and Health," which provides a structured approach to teaching climate justice. The authors argue that such an approach is necessary to address the disproportionate impacts of climate change, particularly on minority communities. The guide incorporates anti-colonial, socially justice-oriented perspectives into climate and health education.

For Jacobi *et al.* (2022), climate justice is mobilized as an action-oriented tool to ensure a balanced climate future for society, emphasizing ethical and political dimensions rather than purely economic concerns. The authors recommend that applying climate justice as a tool requires the creation and promotion of policies that take into account the needs and vulnerabilities of different social groups, rather than treating climate emergencies as if they affected all groups uniformly.

Finally, Gil *et al.* (2023) mobilize the concept of climate justice specifically within the context of tourism policy. The article highlights the lack of integration between climate and tourism policies in Brazil, pointing to a gap in the application of climate justice principles. The

Glasgow Declaration[12] on Climate Action in Tourism is identified as an opportunity to promote climate justice through adaptation and mitigation actions in the tourism sector. The authors emphasize the need for institutional capacity to implement adaptive measures, aligning with the principle of climate justice as articulated in the Glasgow Declaration, particularly in relation to climate action and tourism.

Carmenta *et al*. (2021) mobilize and apply the concept of climate justice in light of environmental justice, focusing on the equitable distribution of environmental benefits and burdens, the recognition of affected communities, and procedural equity in decision-making processes, with particular attention to smallholder farmers.

Similarly, Torres *et al*. (2020, 2021) mobilize and apply the concept of just transition as an analytical tool to understand its incorporation into climate policies in Portugal and Brazil. The authors emphasize the importance of integrating justice and equity into climate adaptation policies, which, in their view, aligns with the principles of a just transition. When addressing climate justice, they note that in the Brazilian case the concept remains distant from the political and research agenda, although there are indications of growing engagement influenced by international mobilizations and major non-governmental organizations.

Milani and Chaves (2022), adopting an international perspective, address climate justice through an analysis of the economic and political practices of China and the European Union (EU) in relation to Brazil, highlighting contradictions between strategic economic interests and the principles of climate justice. The actions of the EU and China are shaped by economic priorities that often override climate justice considerations, resulting in socio-environmental injustice and climate insecurity in Brazil.

In the realm of governmental technical literature, the document *General Strategies and Sectoral Plans for Mitigation and Adaptation*, prepared by the Ministério do Meio Ambiente e Mudança do Clima (MMA, 2024), mobilizes the concepts of climate justice and just transition as part of a cross-cutting strategy [13]. Climate justice is invoked by emphasizing the need for an equitable distribution of benefits and burdens, with particular focus on historically marginalized groups, such as Black women. This approach translates into actions aimed at promoting the inclusion of these groups in climate negotiations, ensuring that their voices are heard and their

[12] For more information, see: https://www.oneplanetnetwork.org/programmes/sustainable-tourism/glasgow-declaration. Accessed on: Jan. 30, 2026.

[13] These definitions are a source of information for other government documents in Brazil, as they are part of a larger strategy that has not yet been published, known as the Climate Plan. For more information, see: https://www.gov.br/mma/pt-br/composicao/smc/plano-clima. Accessed on: Jan. 30, 2026.

rights protected during the transition to a low-carbon economy. It also seeks to prevent mitigation and adaptation policies from deepening inequalities, such as climate racism, and to ensure that the benefits of the transition are accessible to all, rather than restricted to socially privileged groups.

Within private-sector technical documents, notable examples include *Desafios da Transição Energética da ENGIE*, by ENGIE Brasil, and the *Plano Estratégico 2024–2028*, by Petrobras. Broadly, both mobilize and apply the concept of just transition with emphasis on the urgency of advancing an energy transition toward a sustainable future. For ENGIE, just transition is framed in terms of social inclusion, highlighting effective public policies, private investment, and a business ecosystem integrated with local communities; education and diversity are underscored as key components (ENGIE Brasil, 2024).

Petrobras operationalizes the concept through portfolio diversification and emissions reduction, setting a target of carbon neutrality by 2050 and prioritizing inclusive collaboration, diversity, and environmental conservation (Petrobras, 2024). A similar perspective is reflected in the technical document produced by the Just Transition Platform, *Transição Justa para uma Economia de Baixo Carbono no Brasil* (Petrobras, 2024).

Finally, other technical documents, such as *Racismo Ambiental e Emergências Climáticas no Brasil*, organized by researcher Belmont (2023) for the Instituto de Referência Negra Peregum, mobilize the concept of climate justice as a counterpoint to environmental racism. The document challenges Eurocentric approaches and emphasizes the need to confront racial inequalities. It further highlights the importance of financial support and technology transfer to countries most affected by climate change, criticizing the slow implementation and insufficient transfer of resources from developed to developing countries.

Along similar lines, the document *Quem Precisa de Justiça Climática no Brasil*, authored by Louback and Lima (2022), places strong emphasis on climate justice. The concept is mobilized with a focus on equity in the distribution of benefits, the inclusion of marginalized groups—particularly Black women—and the protection of human rights. The authors argue that the realization of a sustainable transition depends on the application of climate justice. They further stress the importance of ensuring the participation of marginalized groups in climate negotiations and policymaking processes, while preventing the reinforcement of climate racism.

Synthesis of the Use of the Concepts

Based on the body of work analyzed, the mobilization and application of these concepts indicate that academia and civil society have increasingly engaged with the debate on climate justice and just transition, with climate justice being more frequently employed. As understood in this article, climate justice functions as a broad, umbrella principle that enables the examination of other relevant concepts and themes, including just transition. In several cases, climate justice is treated as complementary to just transition. The latter, in turn, is often framed as a process of "socioeconomic transition" toward a low-carbon economy, as observed in the private-sector documents analyzed.

As an umbrella concept, the use of "climate justice" in Brazil also enables engagement with related themes such as climate adaptation; the recognition and redress of historical inequalities—particularly those related to gender and race; debates at the intersection of climate, education, and health; and the relevance of Indigenous peoples, traditional communities, and quilombola populations. Based on the review effort and its findings—albeit within certain limitations—Figure 4 presents the thematic axes articulated by the concept of climate justice, as identified in the selected literature.

Figure 4 – Climate justice as an articulating axis of different themes in Brazil

Source: Prepared by the authors (2024).

Conclusion

Revisiting the research question—"How have the concepts of climate justice and just transition been mobilized and applied in the Brazilian literature?"—this scoping review contributes by examining how technical and scientific literature addresses and operationalizes these concepts in Brazil, identifying their main articulations.

Although limited in scope, the methodological rigor applied throughout the stages described above enables the study to offer insights into the interdisciplinary nature of these concepts and the diversity of sectors mobilizing them—civil society, academia, the private sector, and government—from the Paris Agreement through 2024.

The review also demonstrates how climate justice and just transition are articulated through the dimensions of distributive, procedural, recognition (or recognitional), restorative, and retributive justice. These dimensions are frequently cited in the literature as key components of both just transition and climate justice.

Finally, it is evident that under the concept of climate justice, other crucial themes within the Brazilian socioeconomic context are also addressed, including climate adaptation; the recognition and redress of historical inequalities—particularly those related to race and gender; the intersection of climate, education, and health; and the importance of Indigenous peoples, traditional communities, and quilombola populations.

This article therefore contributes by mapping the use of the concepts of climate justice and just transition in Brazil, offering a scoping review that highlights how these concepts have been mobilized and applied in the country.

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