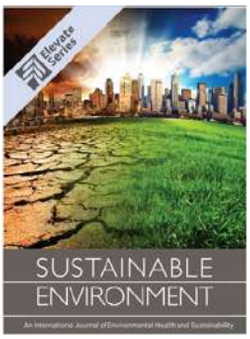

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Amplifying climate resilience: The impact of social protection, social cohesion, and social capital on public support for climate change action

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ABSTRACT

Traditional climate action strategies often overlook the critical role of social cohesion. This study explores how social protection programs and community unity can bolster climate resilience and public support for decarbonization efforts. The study adopted a systematic methodology that employed quantitative (scientometric/bibliometric analysis) and qualitative (content analysis) approaches to analyze existing social protection programs, community cohesion indicators, and public attitudes toward climate change action. Our findings revealed a crucial link: communities with robust social cohesion demonstrate a heightened commitment to climate action. This translates to increased engagement in sustainable practices, information sharing, and mutual support among community members. This suggests policymakers can leverage existing social networks, civic engagement and safety nets to build public support for decarbonization efforts. The study highlighted that building community engagement and inclusivity is critical to fostering a collective commitment to climate action and successfully transitioning to low-carbon societies.

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climate change action; social capital; social cohesion; social protection; scientometric analysis; systematic review

1. Introduction

In recent years, social cohesion and social capital have emerged as essential components of global development agendas. They play an important role in forging a path towards resilience and collective and participatory actions in the face of unprecedented challenges such as climate change (Aleksandrova, 2020; Kundo et al., 2024; Nenning et al., 2023). Climate change disproportionately affects vulnerable and marginalized communities, worsening existing social inequalities. This growing recognition of the need for equitable and sustainable solutions has elevated the importance of social cohesion and social capital. These elements are now recognized as fundamental factors shaping public support for climate action and enhancing resilience to climate change shocks (Prior & Eriksen, 2013).

Social cohesion encompasses cooperation, trust, and inclusive identity, and it plays an essential role in societal dynamics (Chan et al., 2006; Townshend et al., 2015). Cooperation for the common good, trust, and inclusive identity exhibit both horizontal and vertical dimensions, reflecting interactions among individuals, groups, and state institutions (Fazey et al., 2018). Horizontal cooperation showcases communal efforts between individuals and community groups. Vertical cooperation involves collaborative efforts between individuals, community groups and institutions (Burchi et al., 2020). For example, vertical cooperation includes participatory budgeting, community engagement in climate policy formulation, and demonstrating collaboration with state institutions for the common good (Bednarska-Olejniczak et al., 2019; Brink & Wamsler, 2018). Trust, another key attribute of social cohesion, encompasses generalized trust and institutional trust, capturing both horizontal and vertical dimensions (De Juan & Hänze, 2021). Inclusive identity, the third attribute, fosters a society where diverse identities coexist peacefully, creating a broader unity that transcends individual group affiliations (Blennow et al., 2019). Social cohesion and social capital can be positioned within a political context, suggesting their potential role in promoting social inclusion and horizontal and vertical trust in transitioning to a zero-carbon society.

While there is substantial evidence of the effect of social protection on poverty and vulnerability, limited research has focused on its role in public acceptability/support for climate change actions. Social security,

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encompassing tax-financed social assistance and contributory social insurance, can function as a catalyst for social inclusion and cohesion within communities (Malerba, 2022). For instance, those with limited economic resources may find adapting to changing conditions more challenging or recovering from climate-related disasters (Mogomotsi et al., 2020). Indigenous communities often face threats to their traditional livelihoods due to environmental changes, and frontline communities, particularly in developing nations, are usually more exposed to the immediate impacts of climate change, such as rising sea levels, extreme weather events, and food insecurity (Moeti et al., 2023; Schramm et al., 2020). Social protection measures would ensure that climate change burdens are distributed fairly when there is social support for the most vulnerable members of society, including the indigenous communities. Therefore, the interaction between social protection and social cohesion considers economic and environmental implications to avoid exacerbating existing inequalities. Empowering communities to actively participate in shaping climate policies ensures that diverse perspectives are considered and solutions are more likely to be effective and just.

Considering the above background, this study investigates the role of social protection and social cohesion/social capital in shaping public participation in climate actions. We employ a systematic review integrating quantitative (scientometric/bibliometric analysis) and qualitative (content analysis) methods to explore the existing social protection programs, community cohesion indicators, and public attitudes towards climate change action. Two search questions guide the systematic review:

(1) Do social protection mechanisms within a community correlate with heightened social cohesion, thereby contributing to increased climate resilience and fostering public support for climate change action?
(2) Does integrating social protection and social cohesion into climate change mitigation and adaptation strategies enhance the overall effectiveness of climate initiatives, leading to a greater likelihood of successful implementation and widespread public acceptance?

Social cohesion and social capital have traditionally been recognized as essential for development but not explicitly connected to climate action. This study fills the gap by exploring how strong social cohesion and community support systems can boost public participation in climate initiatives. To fill this gap, the study's contribution is based on a systematic review with quantitative and qualitative methods to analyze existing social protection programs, community engagement metrics, and public sentiment toward climate action. Social cohesion, encompassing cooperation, trust, and inclusive identity, fosters collaboration between individuals, community groups, and institutions. The paper argues that social protection programs can strengthen social cohesion, particularly for vulnerable communities. By ensuring a fairer distribution of climate burdens and empowering communities to participate in shaping climate policies, social protection can lead to more effective and just solutions.

The subsequent sections of this paper are organized as follows: Section 2 discusses the chosen methodology and the data sources. In Section 3, we analyze the results, accompanied by the presentation of bibliographic visualizations. Section 4 provides a discussion, providing insights and interpretations of the findings. Finally, Section 5 provides a conclusion and policy recommendations from the study.

2. Methodology

This study employed a systematic review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, as outlined by (Sarkis-Onofre et al., 2021). We opted for this approach because it clearly (i) identifies inclusion and exclusion criteria and (ii) defines research questions that permit systematic research. This systematic review leveraged the power of bibliometrix, a specialized R package, to delve deeper into the relationship between social protection programs and community cohesion in the context of climate action. Bibliometrix is a powerful tool for scientometric analysis, offering a comprehensive suite of functionalities to analyze publication patterns, citation networks, co-authorship relationships, and keyword occurrence (Aria & Cuccurullo, 2017). Bibliometrix facilitated the execution of comprehensive bibliometric, semantic, and content analyses. The content analysis allowed the study to unearth the main results of particular studies and explore how scholars conceptualize the relationship between social protection and social cohesion (Gaur & Kumar, 2018). This qualitative approach complemented the quantitative insights from bibliometric analysis. Figure 1 provides a visual representation of the PRISMA flow process.

Web of Science (WoS) and Scopus were used to retrieve the documents because they are considered the largest databases of peer-reviewed scientific literature (Pranckutė, 2021). Their extensive coverage of scholarly publications makes them ideal for quantitatively examining

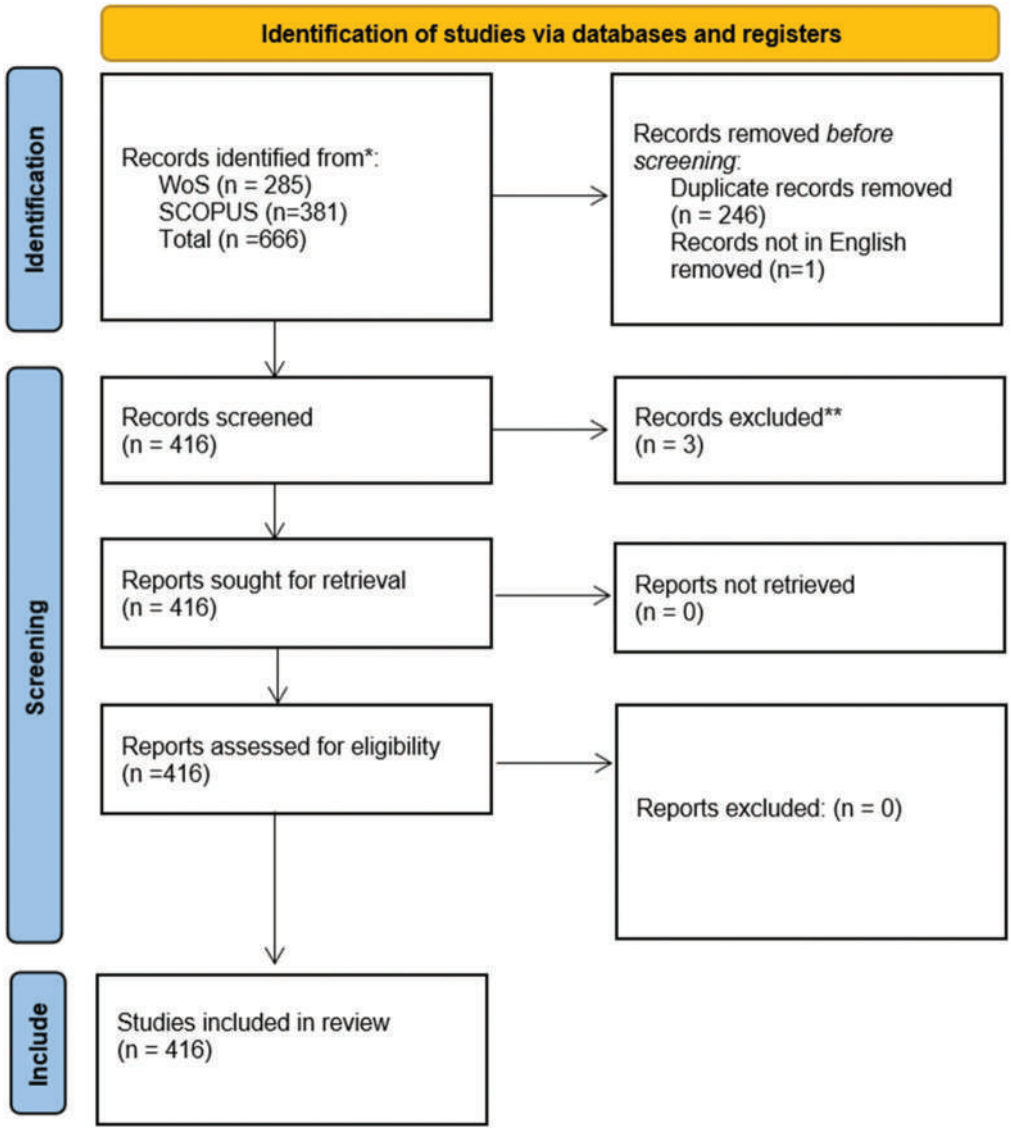

Figure 1. PRISMA flow chart. The PRISMA 2020 http://www.prisma-statement.org/

bibliographic data to identify trends and patterns within research. Moreover, they offer extensive metadata of the literature, abstracts, citation counts, references, authorship details, affiliations, and geographical information.

The data gathering process took place from 4 December 2023 to 3 February 2024, i.e. all the data used for the systematic review, including the articles' bibliographic information, was collected during this period. The study exclusively considered scholarly articles and reviews published in the English language. This language restriction helped ensure that the dataset was consistent and manageable.

2.1. Search strategy

By systematically examining the literature in three critical fields, the study provides a comprehensive understanding of the role of social cohesion, social capital, and social protections on public support for climate actions. Table 1 shows the inclusion and exclusion criteria for retrieving articles from Scopus and WoS. The four critical fields used in our search are as follows:

Climate Resilience: Exploring the concept of climate resilience involved investigating terms such as 'climate mitigation', 'climate adaptation', and 'climate resilience'.

Social cohesion: Diverse terms associated with social cohesion were used, including 'Social capital', 'Social cohesion', and 'Community engagement'.

Social protection: Examining terms such as 'Social protection', 'Safety net*', 'Cash transfer*', 'Social insurance', and 'Social policy' provided insights into how these policies affect public acceptance and support for climate change actions.

Table 1. Inclusion and Exclusion Criteria for the retrieved records

Aspect	Criteria
Logical Statement Scopus	TITLE-ABS-KEY (("climat* mitigation" OR "climat* adaptation" OR "climat* resilience") AND ("Social capital" OR "Social cohesion" OR "Community engagement" OR "Civic participation" OR "Social networks" OR "public support*" OR "public accept*" OR "community accept*" OR "community support*")) TITLE-ABS-KEY (("climat* mitigation" OR "climat* adaptation" OR "climat* resilience") AND ("Social protection" OR "Safety net*" OR "Cash transfer*" OR "Social insurance" OR "Social policy"))
Logical Statement WoS	TS= (("climat* mitigation" OR "climat* adaptation" OR "climat* resilience") AND ("Social capital" OR "Social cohesion" OR "Community engagement" OR "Civic participation" OR "Social networks" OR "public support*" OR "public accept*" OR "community accept*" OR "community support*")) TS= (("climat* mitigation" OR "climat* adaptation" OR "climat* resilience") AND ("Social protection" OR "Safety net*" OR "Cash transfer*" OR "Social insurance" OR "Social policy"))
Inclusion	(1) Document written in English. (2) Document containing the keywords
Exclusion	(1) Documents not written in English. (2) Documents not containing the keywords

Public participation: Finally, the study explored the broader policy landscape influenced by public participation in climate actions. Terms used included 'Civic participation', 'Social networks', 'public support*', 'public accept*', 'community accept*', and 'community support*'. These terms are examined to provide insights into the recommendations and considerations that emerge from the literature.

2.2. Search criteria and screening of documents

The document screening process was conducted in a sequential three-step manner: initially, by reviewing the article titles; subsequently, by examining the abstracts of the articles; and finally, by delving into the complete articles.

A two-step selection process was employed to ensure the identified articles are relevant to the research and contribute to achieving the study purpose. The first step involved applying inclusion criteria, which guaranteed that articles were (i) Published in high-quality databases like Scopus and WoS and (ii) Related to the subject areas of interest. (iii) Written in English.

The second step involved a manual review of the article titles, examining the abstracts, and finally, delving into the complete articles. Applying these combined criteria ensures that the selected articles directly address the research questions and contribute to achieving the study's overall purpose.

While searching, efforts were made to ensure transparency and reproducibility by adhering to predefined inclusion and exclusion criteria outlined in Table 1. However, we must acknowledge that despite our best efforts, limitations have been encountered during the search process. These limitations include constraints imposed by database interfaces (the two databases do limit the number of keywords used in the search string), variations in indexing labels, and the possibility of missing relevant studies due to the complexity of the research topic synonyms and search syntax (some topics may have many synonyms.

2.3. Assessment of bias and rigor

This study recognizes the importance of the reliability of the selected articles and the overall validity of the research findings. Therefore, this study employed a two-step approach to assess bias and rigor. The first layer involved applying strict inclusion and exclusion criteria. Articles were selected based on their publication in reputable databases (Scopus and WoS) and a specific keyword selection was used to ensure thematic relevance to the research subject areas. By focusing on these criteria, we inherently selected articles with a higher likelihood of quality and reliability. Building upon the initial selection process, the second layer involved a manual review of the articles' titles, abstracts and full text. This additional layer aimed to identify potential biases within the included studies. By examining the language and framing used in the titles and abstracts, potential biases could be flagged for further evaluation or exclusion. The co-authors did the screening independently to reduce bias, and differences were reconciled by discussion amongst the co-authors.

3. Results and analysis

In this section, the study findings are organized into three subtopics. Firstly, a summary of descriptives from the included studies is provided. This is followed by an overview of the included studies based on social cohesion, social capital and social protection. The third subtopic focuses on a bibliometric outlook, covering annual scientific production, the most cited keywords, impactful sources (journals), contributions from various countries, and the distribution

Table 2. Main information of the Scopus, WoS and Merged Data sets

	Merged Data Set	Scopus data	WoS data
MAIN INFORMATION ABOUT DATA			
Timespan	2006:2024	2006:2024	2006:2024
Sources (Journals, Books, etc)	246	221	162
Documents	416	374	282
Annual Growth Rate %	12,98	12,25	6,29
Document Average Age	4,62	4,66	4,53
Average citations per doc	18,98	20,98	23,38
References	1	1	1
DOCUMENT CONTENTS			
Keywords Plus	1549	1707	836
Author's Keywords	1269	1195	941
AUTHORS			
Authors	1446	1307	1063
Authors of single-authored docs	58	54	38
AUTHORS COLLABORATION			
Single-authored docs	60	54	38
Co-Authors per Document	3,9	3,82	4,08
International co-authorships %	27,4	0,5348	40,07
DOCUMENT TYPES			
article	308	286	241
article article	2	2	
article conference paper	1	1	
article; early access	9		9
article; proceedings paper	2		2
book	2	2	
book chapter	38	39	
conference paper	12	15	
editorial	3	3	
editorial material	5		5
editorial material; book chapter	1		1
letter	2	2	
note	2	3	
proceedings paper	5		5
review	23	21	18
review; early access	1		1

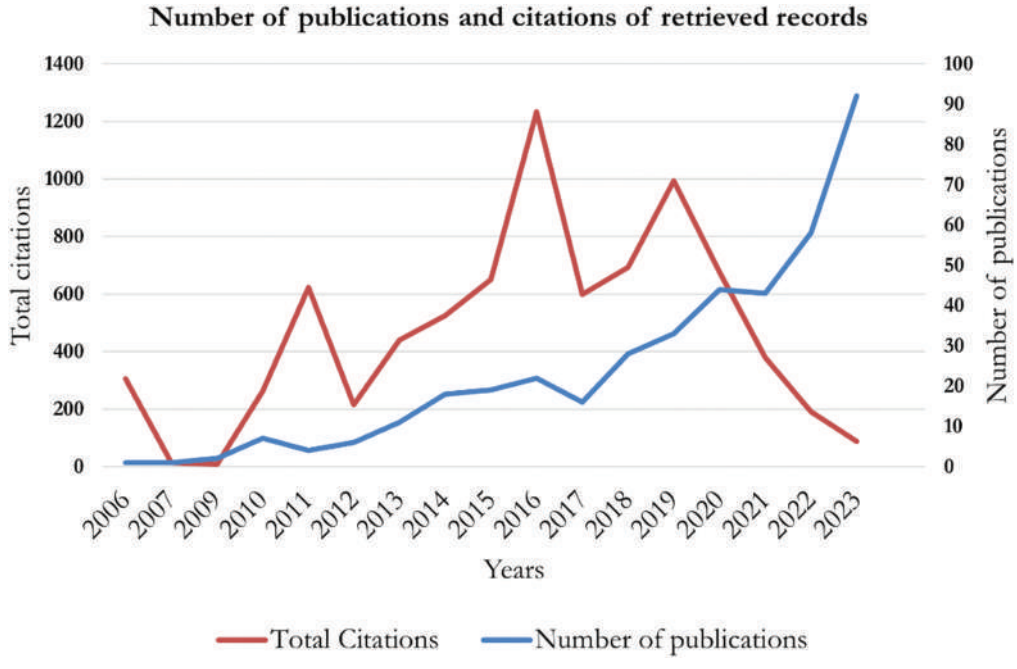

Figure 2. Publication and Citation Trends from 2006 to 2023.

of research across academic fields. Finally, the discussion delves into a keyword analysis, exploring cluster topics.

3.1. Descriptives

Table 2 summarizes Scopus, WoS data and the merged dataset. The merged dataset, comprising 323 documents, presents a more extensive pool than Scopus (197) and WoS (112) individually, indicating a more extensive set of publications in the combined data.

The merged data set and Scopus exhibit similar high annual growth rates of around 12–13%, indicating a consistent document increase over the years. WoS has the highest average citations per document (23.38), followed by Scopus (20.98) and the Merged Data Set (18.98). This suggests that, on average, documents from WoS receive more citations, indicating potentially higher impact or visibility. WoS has a significantly higher percentage of international co-authorships (40.07%) compared to the merged data set (27.4%) and Scopus (0.5348%). This could indicate a global collaboration network within the WoS dataset.

3.2. Publication trends

From 2006 to 2023, there was an increasing number of publications on social factors shaping the climate change action discourse, as illustrated in Figure 2. This suggests a growing interest in understanding the impact of social protection, social cohesion, and social capital on public support for climate change action. Researchers and scholars may recognize the importance of social factors in shaping public attitudes and behaviors related to climate change.

The years 2022 and 2023 saw a substantial increase in publications, possibly indicating a continued and expanded exploration of the topic. However, there was a sharp decline in citations from 2019 to 2023. It is plausible that the Coronavirus Disease 2019 (COVID-19) pandemic prompted a shift in research priorities toward COVID-19-related studies, public health, and societal impacts. This shift might have drawn attention and resources away from topics related to social protection, social cohesion, and social capital in the context of climate change action, resulting in a potential decline in citations for publications in that area. The pandemic could have influenced how researchers and scholars searched for and cited literature. Funding priorities shifted during the pandemic to address urgent public health concerns.

3.3. Top 10 most productive authors

Table 3 presents the top 10 most influential authors, offering valuable insights into their respective contributions to the field. The bibliometric analysis revealed a list of prolific authors contributing to the discourse on social protection, social cohesion, and public participation in climate actions. Jacobs B and Lubell M occupy the top positions, with five articles each. They are followed in the second position by Cunningham R, Ingold K, and Prakash A., each with four articles. The fractionalized ranking system, calculated by dividing the total number of articles an author has by the number of authors on that specific article, offers a way to distribute credit for an article amongst all its authors. Jacobs B had the highest fractionalized ranking of 2.33, implying that he contributed to articles with fewer co-authors. Glacki S, on the other hand, has the lowest fractionalized count, suggesting that he has collaborated on articles with many co-authors, resulting in more distributed credit to their authorship.

3.4. Top 10 most impactful articles in the field

Table 4 presents the influential research articles assessing their impact through total citation counts (TC),

Table 3. Top 10 most influential authors

References	Authors	Articles	Authors	Articles Fractionalized	Rank
(Cunningham et al., 2016, 2021; Jacobs et al., 2016, 2020; Kekulandala et al., 2023)	Jacobs B	5	Ingold K	2.33	1
(Huang et al., 2023; McAllister et al., 2014; Rudnick et al., 2019; Vantaggiato & Lubell, 2023; Vantaggiato et al., 2023)	Lubell M	5	McLeman R	2.00	2
(Cunningham et al., 2016, 2021; Cvitanovic et al., 2016; Kekulandala et al., 2023)	Cunningham R	4	Remington G	2.00	3
(Ingold, 2017; Ingold & Balsiger, 2015; Ingold & Fischer, 2014; Ingold et al., 2019)	Ingold K	4	Susskind L	2.00	4
(Ko et al., 2023; Pandey et al., 2021; Pelling et al., 2022; Uji et al., 2021)	Prakash A	4	Lubell M	1.62	5
(Bremer et al., 2019; Haque et al., 2017; Marschütz et al., 2020)	Bremer S	3	Ngaruiya G	1.58	6
(Savin et al., 2023; Taberna et al., 2023; van Duinen et al., 2012)	Filatova T	3	Frantzeskaki N	1.17	7
(Findlater et al., 2020; Peterson St-Laurent et al., 2019)	Findlater K	3	Jacob B	1.16	8
(Frantzeskaki, 2022; Frantzeskaki et al., 2019; Kabisch et al., 2016a)	Frantzeskaki N	3	Hall D	1.10	9
(Bailey et al., 2024; Moglia et al., 2022; Perera et al., 2023)	Glackin S	3	Vantaggiato F	1.03	10

Table 4. most influential articles in the field

Ref	Title	Year	TC	TC per year	NTC	Rank
(Pradhan et al., 2017)	A Systematic Study of Sustainable Development Goal (SDG) Interactions	2017	684	85.5	5.90	1
(Kabisch et al., 2016)	Nature-based solutions to climate change mitigation and adaptation in urban areas: Perspectives on indicators, knowledge gaps, barriers, and opportunities for action	2016	663	73.7	8.53	2
	Managing the risks of extreme events and disasters to advance climate change adaptation: spec report of the intergovernmental panel on climate change	2012	483	37.2	4.77	3
(Seddon et al., 2020)	Understanding the value and limits of nature-based solutions to climate change and other global challenges	2020	471	94.2	11.11	4
(Seto et al., 2010)	The New Geography of Contemporary Urbanization and the Environment	2010	466	31.1	3.41	5
(Andrée et al., 2019)	Revisiting the relation between economic growth and the environment; a global assessment of deforestation, pollution and carbon emission	2016	319	35.4	4.10	6
(Faivre et al., 2017)	Nature-Based Solutions in the EU: Innovating with nature to address the social, economic and environmental challenge	2017	301	37.6	2.59	7
(Tellman et al., 2021)	Satellite imaging reveals an increased proportion of the population exposed to floods	2021	292	73.0	9.79	8
(Watts et al., 2017)	The Lancet Countdown: tracking progress on health and climate change	2017	285	35.6	2.46	9
(Klein et al., 2005)	Integrating mitigation and adaptation into climate and development policy: three research questions	2005	280	14.0	2.46	10

average citation counts per year (TC per year) and normalized total citations (NTC).

The article titled 'A Systematic Study of Sustainable Development Goal Interactions' occupies the first position as the most cited paper, with a substantial total citation count (TC) of 684 and an average citation count per year (TC per year) of 85.5. This paper was published in 2017, shortly after the Paris Climate Agreement 2015. Therefore, its publication year aligns with heightened global awareness and emphasis on achieving sustainability goals. During this time, there was a growing interest in understanding the dynamics and implications of SDG interactions. 'Nature-based solutions to climate change mitigation and adaptation in urban areas' follows in the second position.

3.5. Top 10 most productive sources

Given the multidimensionality of climate change's social impacts, the synergy of various disciplines like sociology, environmental science, economics, and public policy enriches the understanding of the topic. As shown in Table 5, publications in journals such as Bioscience, 'Journal of Clean Production', and Regional Environmental Change further highlight the intersection of diverse perspectives within this multidisciplinary domain.

3.6. Top 10 corresponding author's countries

Table 6 shows the top 10 corresponding author's countries in the context of the research theme. It presents the article count, frequency (Freq), Single Country Publications (SCP), Multiple Country Publications (MCP), and the MCP Ratio (calculated as MCP/Article Count). The United States leads in both article count and frequency, indicating a substantial research contribution to the social ramifications of climate change. On the other hand, Germany stands out with a high MCP Ratio (0.5263), suggesting multiple-country research collaborations.

Figure 3 shows the collaboration map of countries, which reveals the patterns of cooperation in research on social dimensions of climate change action. There are frequent collaborations between Canada, the USA and European countries as well as between European countries and Australia. South Africa is the most active country on the African continent and collaborates with the USA, European countries, and Australia. However, Figure 3 also indicates fewer collaborations with other African countries. Possible reasons for this limited

Table 5. Most influential sources/journals

Journals	TC	Number of publications
Ecology and Society	627	4
Mitigation and Adaptation Strategies for Global Change	472	2
Disasters	305	1
Climate and Development	286	6
Environmental Science and Policy	259	10
Journal of Cleaner Production	226	3
Landscape and Urban Planning	200	2
Regional Environmental Change	199	6
International Journal of Urban and Regional Research	184	2
Bioscience	176	1

Table 6. Most productive corresponding author countries

Country	Article Count	Freq	SCP	MCP	MCP_Ratio	Rank
USA	36	0.1272	25	11	0.3056	1
United Kingdom	28	0.0989	19	9	0.3214	2
China	20	0.0707	14	6	0.3000	3
Germany	19	0.0671	9	10	0.5263	4
India	15	0.0530	14	1	0.0667	5
Australia	14	0.0495	11	3	0.2143	6
Netherlands	12	0.0424	7	5	0.4167	7
Sweden	12	0.0424	10	2	0.1667	8
Japan	11	0.0389	9	2	0.1818	9
Canada	10	0.0353	7	3	0.3000	10

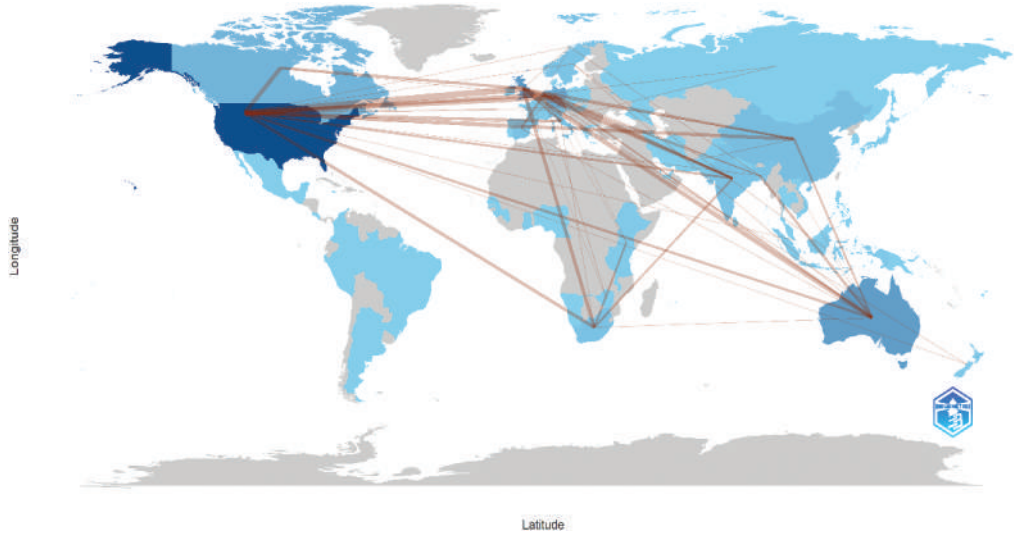

Figure 3. Country collaboration map.

engagement could include disparities in research infrastructure, funding constraints, and varying research priorities. The limited collaboration with African countries, aside from South Africa, is a cause for concern, particularly considering Africa's disproportionate vulnerability to climate change shocks and prevalent high levels of inequalities. More extensive research on the social dimensions of climate change is crucial for understanding and addressing the challenges African nations face.

3.7. Keyword co-occurrence

Keyword co-occurrence occurs when two or more keywords or terms appear together in a document or a set of documents. It measures the frequency

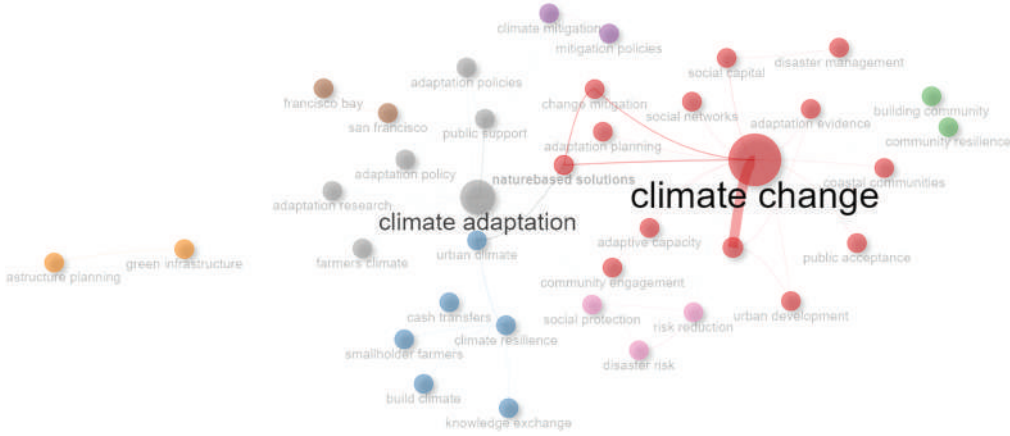

Figure 4. Keyword co-occurrence network.

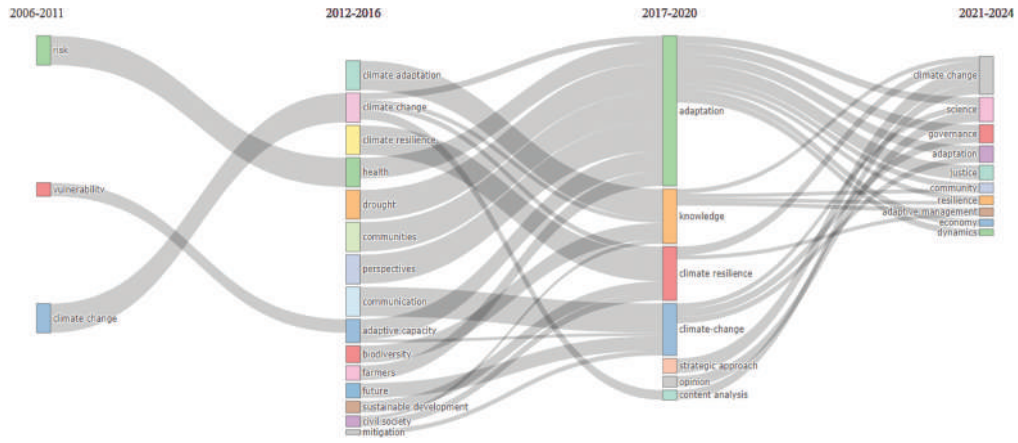

Figure 5. Thematic Evolution from 2006 to 2024.

with which specific terms appear in proximity to each other within a document (van Eck & Waltman, 2010). Keyword co-occurrence analysis is used to identify emerging, niche, and well-established research themes (Tamasiga et al., 2023). Figure 4 shows the clusters of keywords and the links between them. The colored nodes denote keywords belonging to the same theme/cluster. Links between nodes represent co-occurrence relationships, with color and thickness indicating the keywords' strength and frequency of co-occurrence. The size of the colored node signifies the frequency of occurrence of the keyword, indicating its importance.

Keywords such as community engagement, social networks, and public acceptance, among others denoted in red, correspond to emerging themes of 'enhancing public acceptance of climate change mitigation in urban areas through social networks' and 'building coastal community resilience' as summarized in Table 7 below.

3.8. Thematic evolution

The thematic evolution in Figure 5 reveals a progression from risk assessment to strategic adaptation,

Table 7. Clusters derived from keyword co-occurrence and the emerging themes

Cluster	Keywords	Emerging Themes
Blue	Cash transfer Urban climate Smallholder farmers Knowledge exchange Build climate	Community-Led Climate Action: Smallholder Farmers and the Role of Social Capital Strengthening Urban Climate Resilience through Socially Inclusive Strategies
Red	Urban development Coastal communities Public acceptance Community engagement Adaptive capacity Adaptation planning Social networks Social capital Disaster management Adaptation evidence Change mitigation	Enhancing Public Acceptance of Climate Change mitigation in Urban areas through Social Networks Building Coastal Community Resilience: through the Integration of Social Capital and Adaptation Strategies
Green	Building community Community resilience	Fostering Climate Resilience through Community Building and Social Capital
Orange	Infrastructure planning Green infrastructure	Socially Integrated Infrastructure Planning with Green Initiatives"
Grey	Adaptation policies Public support Climate adaptation Adaptation research Farmers climate	The Role of Adaptation Research and Inclusive Policies in cultivating public support for climate resilience Farmer-Centric Climate Adaptation Policies and alignment with agricultural resilience
Pink	Risk reduction Disaster risk Social protection	Enhancing Community Resilience through Social Protection Strategies for Disaster Risk Reduction
Purple	Climate mitigation Mitigation policies	Socially inclusive climate mitigation policies

community participation and inclusion, and the incorporation of social, economic and environmental justice into climate mitigation and adaptation. Over the years spanning from 2006 to 2011, the predominant thematic focus centered on identifying and comprehending risks associated with climate change. This period involved assessing vulnerabilities across various sectors, such as agriculture, infrastructure, and communities, with efforts directed at understanding the potential consequences of climate change and mapping areas most susceptible to adverse effects. However, challenges arose due to limited data and an incomplete understanding of the long-term impacts, making developing comprehensive risk management strategies a formidable task.

Transitioning into 2012–2016, the thematic evolution emphasized climate adaptation and resilience. The discourse pivoted from risk assessment to developing strategies to adjust to changing climate shocks and build resilient systems and communities against climate-related shocks. Challenges during this period included the delicate balance between short-term adaptation measures and long-term resilience building and the effective allocation of resources.

Subsequently, from 2017 to 2020, the thematic landscape shifted towards knowledge and governance. There was a focus on deepening scientific understanding through research investments and establishing robust governance structures to address climate-related challenges. Bridging the gap between scientific knowledge and policy implementation posed a challenge, necessitating practical international cooperation.

In the most recent period from 2021 to 2024, the thematic focus has evolved to address the justice dimensions of climate change actions. This entails considerations of social and economic equity, fair distribution of responsibilities, and the incorporation of economic justice into climate change responses. Challenges include balancing economic growth with environmental sustainability and addressing historical and current injustices related to climate impacts. Cross-cutting themes have emerged throughout these periods, emphasizing the importance of health considerations and the role of communities and civil society in shaping effective climate action.

4. Discussion

In this section, we employed content analysis on the included studies to extract valuable insights and address the two research questions in the systematic review. Firstly, we categorized the studies based on crucial thematic elements. These include studies exploring the intricate relationship between social cohesion and climate change, investigations into the nexus of social protection and climate actions, examinations of communication dynamics in the context of climate change and its intersection with social capital, and finally, studies delving into public responses to climate change and the influential role played by social capital. The study's results based on our current study's thematic areas are summarized in Table 8. Under the social cohesion and climate change thematic area, one of the conclusions from existing studies is that community bonds play

Table 8. Summary of studies based on thematic areas

Thematic Area	Overall Conclusions	References
Social cohesion and climate change action	Strong social cohesion is linked to a higher willingness to engage in pro-environmental behaviors. Community bonds positively impact climate change support.	(Akter, 2020; Babcicky & Seebauer, 2020; Boarini et al., 2018; Cherng et al., 2019; Cook & Swyngedouw, 2012; Dean, 2023; Thoidou, 2017; Townshend et al., 2015)
Social capital and public response to climate	People with higher social capital are more likely to have climate-mitigation behavioral intention and show support for climate policy. At the same time, greater national fossil fuel dependency tends to inhibit public response to climate change. Trust in institutions plays a crucial role in promoting public participation in climate actions.	(Abunyewah et al., 2024; Fletcher et al., 2020; Guardaro et al., 2022; Hao et al., 2020; Ingold, 2017; Jordan, 2015; MacGillivray, 2018; Masud-All-Kamal et al., 2021; Ntontis et al., 2020; Patnaik & McPeak, 2023; Paul et al., 2016; Roque et al., 2021; Tiller et al., 2022) (Aldrich et al., 2016; Carmen et al., 2022; Jones & Clark, 2013; Nyahunda et al., 2021
The role of social protection in climate change mitigation	Social protection measures contribute to climate change mitigation by reducing vulnerability and promoting sustainable practices.	(Coirolo et al., 2013; Fischer, 2020; Haug & Wold, 2017; Huber & Murray, n.d.; Igbatayo et al., 2022; Kundo et al., 2021, 2023; Nishtar & Khan, 2023; Scognamillo & Sitko, 2021; Weldegebriel & Prowse, 2013)
Social capital, social protection climate communication, and public acceptance	Effective communication is crucial in covering social protection programs against climate shocks. When information about resource scarcity circulates in a socially cohesive society, individuals understand the available support during climate-related challenges	(Bakaki & Bernauer, 2018; Bendixen et al., 2022; Bergquist et al., 2020; Coirolo et al., 2013; Giordono et al., 2023; Hannibal & Vedlitz, 2018; Hanson-Easey et al., 2018; Harris & Howe, 2023; Hart et al., 2015; Houser et al., 2022; Kruse & Atkinson, 2022; León et al., 2022; Linde, 2018; Merrill et al., 2018; Netzel et al., 2021; Pianta & Brutschin, 2022; Pillay & van den Bergh, 2016; Ščasný et al., 2017; Yazar & York, 2022)

Table 9. Summary of social protection elements, interaction with climate action and public support for climate actions

Social protection elements	Interaction with climate action	The outcomes of promoting public climate action
Social Safety Nets	Provide support during climate-related challenges	Enhanced community resilience and increased ability to cope with climate impacts. Providing non-farm-based income can hedge the impact of climate shock on farm income.
Insurance programs	Mitigate financial risks associated with climate events	Reduced economic vulnerability, fostering long-term climate resilience
Early Warning Systems	Enable timely response to climate-related threats	Improved preparedness and effective community response to climate emergencies
Education and Awareness	Promote understanding of climate change and its impacts	Increased public awareness, leading to informed and proactive climate action
Inclusive Policies	Ensure vulnerable groups are considered in climate strategies	Enhanced equity and social justice, fostering widespread support for climate action. Improved community well-being and reduced dependence on climate-vulnerable livelihoods
Community Engagement	Involve communities in decision-making and action-planning	Strengthened sense of ownership and active participation in local climate initiatives

Table 10. Interactions between social protection-social capital and outcomes for climate actions

Social/Social Capital Cohesion Elements	Interactions	Outcomes of climate actions	References
Trust and social protection	Trust within a community facilitates the effective implementation of social protection mechanisms. When individuals trust that social safety nets and support systems will be available during climate-related challenges, they are more likely to embrace and actively participate in climate action initiatives.	The synergy between trust and social protection contributes to a positive perception of climate policies. Public confidence in the effectiveness and fairness of climate initiatives enhances overall support and cooperation.	(Brown et al., 2018; Davies et al., 2013; Giordono et al., 2023; Houser et al., 2022)
Social networks and climate action	Strong social networks are crucial in disseminating information about climate change and related actions. Social connections enable the sharing of knowledge on sustainable practices, fostering a collective understanding of the importance of climate action.	Well-connected communities are more likely to mobilize for climate-related projects, organize local initiatives, and amplify the reach of awareness campaigns. Social networks act as conduits for the transmission of pro-environmental attitudes.	(Abid et al., 2017; Alare et al., 2022; Cunningham et al., 2016; Knighton et al., 2018; Scheffran et al., 2012; Sprout, 2022)
Shared norms, perceptions and values in climate initiatives	Commonly shared norms and values within a community influence attitudes toward environmental stewardship. When these values align with the principles of climate action, individuals are more likely to endorse and adopt sustainable behaviors.	Social cohesion based on shared environmental values contributes to a collective commitment to climate-friendly practices. It fosters a sense of responsibility for the environment and promotes a culture of sustainability within the community.	(Harris & Howe, 2023; Lorenzoni et al., 2007; O'Connor et al., 1999; Pianta & Brutschin, 2022)
Civic engagement and climate resilience	Civic engagement strengthens the community's ability to adapt to and mitigate the impacts of climate change. Actively involved community members contribute to the development and implementation of climate resilience strategies	Engaged communities are more resilient and better equipped to face climate challenges. Public involvement in climate initiatives enhances the effectiveness of adaptation measures and strengthens community-wide preparedness.	(Furman et al., 2014; Ruiz-Mallén et al., 2022; Sarzynski, 2015)

a crucial role in positively impacting climate change support.

4.1. The role of social protection in climate change mitigation

The key finding based on our study is that social protection programs strengthen community resilience to climate shocks, ultimately leading to a greater willingness to support climate action initiatives. Table 9 provides the results, outlining the interplay of social protection elements with climate action and their impact on fostering public support, acceptance, or participation. The effectiveness and accessibility of social protection measures significantly shape individuals' perceptions of climate change. Social protection mechanisms, including social safety nets, insurance programs, and access to essential services, enhance a community's resilience to climate change. It reduces vulnerability by providing a buffer against the socio-economic impacts of climate-related events, such as extreme weather events or agricultural disruptions. As individuals and communities feel more secure in the face of climate risks, their willingness to support and participate in climate action initiatives will likely increase. Temporary income support during droughts or floods provides immediate relief and helps communities recover from climate-related disasters. Insurance programs can mitigate financial losses from extreme weather events, allowing individuals and businesses to rebuild and resume normalcy quickly. Early warning systems, another form of social protection, enable communities to prepare for emergencies and minimize damage.

Studies by (Huber & Murray, n.d.; Kundo et al., 2021) support our finding, demonstrating that communities with robust social protection systems are more committed to climate action. However, the effectiveness of these programs hinges on the specific elements implemented. Furthermore, in the face of escalating climate change impacts, social protection emerges as an essential tool in fortifying societies against multidimensional poverty and vulnerability to shocks in developing countries (Kundo et al., 2021). The effectiveness and accessibility of social protection measures significantly shape individuals' perceptions of climate change. When communities witness tangible support through timely assistance, recovery aid, and adaptive measures, they are more likely to view climate change as a shared challenge that necessitates collective action.

In contrast, Weldegebriel and Prowse (2013) conducted a study in Ethiopia showing that receiving transfers from the productive safety net program did not boost farm or non-farm income on average. This suggests that social safety nets may not effectively support smallholder farmers in positively diversifying income sources for climate adaptation in some settings. Similarly (Safety Nets, n.d.), argued that a critical challenge is the insufficient coverage and allocation of resources for social protection in developing nations. These countries allocate 1.5% of their GDP to pro-poor programs, leaving nearly two-thirds of the impoverished population without benefits. The spending and coverage gaps are more pronounced in poor developing countries, mainly in Africa and Asia. This is an alarming challenge as these regions are often vulnerable to high-risk natural disasters and do not receive the required amount of climate financing for mitigation and adaptation, exacerbating the challenge.

4.2. Social cohesion/social capital and climate action

Our findings highlight the critical roles of social cohesion and social capital in fostering collective action on climate change. Communities with dense preexisting networks of trust and reciprocity are more likely to prepare for, respond to, and recover more effectively from climate change shocks, pandemics, and natural disasters. Additionally, these communities demonstrate greater resilience in responding to climate-related shocks and disasters. Several studies support these findings. By applying a difference in difference propensity score matching, Patnaik and McPeak (2023) concluded that active community participation in climate projects enhances the probability of engaging in future collective actions and offering assistance to fellow community members in Mali. Similarly, research by Hien et al. (2022) suggests that social cohesion facilitates the dissemination of knowledge and practices related to climate action. Individuals in cohesive communities are more receptive to adopting sustainable behaviors modeled by their peers, creating a positive feedback loop toward community-wide environmental commitment. Similarly, Abunyewah et al. (2024) highlight the importance of social support networks in mitigating the mental health challenges faced by individuals dealing with environmental stressors. Their study reveals a positive association between strong social ties and a person's ability to cope with ecological events' negative mental health consequences. Furthermore, Giordono et al. (2023) suggest that perceptions of harm from extreme climate events can lead to increased trust in local government, which translates to more significant support for climate change mitigation policies.

However, some limitations exist. While social capital emphasizes pre-existing networks of trust, Ntontis et al. (2020) argue that it might overlook the emergence of new support groups during disasters. Their proposed framework based on social identity acknowledges this limitation and highlights the ability of communities to organize and provide support even in the absence of established ties. Their approach overcomes the limitations of social capital, because it can explain the processes of group behavior in disasters, acknowledges people's propensity to organize collectively, promotes bottom-up approaches to community resilience, and recognizes emergent communities during climate change events and natural disasters. Another contrasting perspective comes from Fletcher et al. (2020) who cautions that informal social capital, while beneficial, may perpetuate gender inequality and inter-group differences, limiting socially inclusive adaptation.

4.3. Interplay of social cohesion and social protection in promoting public climate action

This section examines the joint interaction effects of social capital and social protection on climate actions (see Table 9). Our findings highlight that social cohesion, characterized by trust, inclusive identity, and shared norms, interacts with social protection programs to create an environment conducive to collective action on climate change. Social protection programs that address disparities and promote inclusivity contribute to this sense of shared responsibility for climate action, ensuring no community is left behind.

Several studies support the positive interaction between social cohesion and social protection in promoting climate action. Social protection programs

foster trust within communities, encompassing trust in neighbors and in governing institutions (Paul et al., 2016). This generalized and institutional trust is crucial for encouraging collaboration and cooperation on climate initiatives. Furthermore, research by (Brown et al., 2018; Davies et al., 2013; Giordono et al., 2023; Houser et al., 2022) suggests that the synergy between trust and social protection contributes to a positive perception of climate policies, ultimately leading to more significant public support and cooperation.

Strong social networks, another element of social cohesion, play a crucial role in disseminating information about climate change and related actions. Through social connections, individuals share knowledge on sustainable practices, fostering a collective understanding of the importance of climate action (Abid et al., 2017; Alare et al., 2022; Cunningham et al., 2016; Sprout, 2022). This knowledge-sharing empowers communities to mobilize for climate projects, organize local initiatives, and amplify awareness campaigns, ultimately leading to broader public engagement.

In contrast, Paul et al. (2016) highlight a potential paradox: while social capital promotes collective action, it might hinder individual efforts at private adaptation. This result suggests that policymakers should consider the differences in public and private adaptation behaviors concerning trust and social capital when formulating climate adaptation interventions. In highlighting the public perception of government efficacy (Houser et al., 2022), indicated that perceptions of government efficacy, threat appraisal, climate risk perception, and individual climate change beliefs influence support for adaptation policy (See Table 10).

5. Conclusion and recommendations

In recent years, there has been a growing interest in understanding the impact of social factors, particularly social protection, social cohesion, and social capital, on public support for climate action. This study used a systematic review approach to address two research objectives. The first objective was to analyze the role of social protection in climate mitigation. The study's second objective was to explore the interplay of social cohesion and social security in promoting public climate action.

Based on the bibliometric analysis, the findings of the study showed an upward trajectory in studies on the impact of social protection, social cohesion, and social capital on public support for climate change action, specifically between 2006 and 2023, no African country is featured on the top 10 corresponding author's countries. Moreover, there are generally few collaborative studies between African and developed countries on the social dimensions of climate change. This finding is concerning. It highlights the need to improve research funding and infrastructure in Africa, particularly with a focus on climate change action. Climate change-related challenges have direct negative consequences on rural livelihoods, rural development, and the general well-being of communities.

The content analysis has highlighted five noteworthy findings that emphasize the importance of social cohesion and social protection programs in building climate resilience and fostering public support for climate action. Firstly, strong social cohesion characterized by trust and reciprocity allows communities to prepare for, respond to, and recover from climate shocks more effectively. Social networks also play a crucial role in disseminating knowledge about sustainable practices, leading to collective action on climate change. Secondly, well-designed social protection programs function as a safety net during climate disasters, reinforcing a sense of security and increasing willingness to participate in climate initiatives. Thirdly, the interplay between social cohesion and protection creates a powerful synergy. When trust in institutions and social connections is vital, communities are more receptive to social protection programs designed to address climate challenges, ultimately leading to more significant public support for climate action. However, it is essential to acknowledge that social capital promotes collective action, it may discourage individual efforts at adaptation in some cases. Additionally, informal social networks can reinforce existing inequalities if they exclude certain groups. Finally, the study underscores the significance of public perception. When people feel threatened by climate change, they may be more supportive of government policies to address it. Trust in government efficacy also plays a role in supporting climate adaptation initiatives.

Based on the findings of this systematic review, we suggest practical policy recommendations for policymakers and practitioners:(1) Design social protection programs to specifically address climate vulnerabilities faced by communities (e.g. social safety nets for the most vulnerable, temporary income support during droughts or floods). (ii) Ensure accessibility and effectiveness of social protection programs, notably by expanding coverage for remote area dwellers in developing countries; (iii) Facilitate community organizing by supporting the creation and strengthening of community groups focused on climate action (e.g. funding community training centers, grants for peer-to-peer learning); (iv) Promote civic engagement by creating opportunities for public participation in decision-making processes related to climate change and social protection (e.g. citizen advisory boards, public forums); (v) promote trust in institutions by ensuring transparency and accountability in the design and implementation of social protection programs.

While this study offers a critical perspective on social cohesion and social protection as pathways to public climate action, it does have limitations. One constraint is the inherent focus of a systematic review of existing research. The systematic review methodology relies on existing research, potentially missing unpublished data or emerging trends. Additionally, the research design using quantitative and qualitative methods may face challenges in integrating the data effectively, potentially leading to a less comprehensive understanding of the complex interplay between social factors and climate action.

This study lays the groundwork for future research directions. The current study's review relies on Scopus and WoS academic databases. However, future research could benefit from a broader approach. This could involve including additional databases like Dimension and PubMed for a more complete picture of academic literature. Additionally, incorporating non-academic sources like government reports, NGO publications, and community-based knowledge would offer valuable insights beyond traditional academic research. Moreover, future studies need to employ longitudinal studies to track social cohesion, social protection programs, and public climate action over time, which could provide a clearer picture of cause-and-effect relationships. Finally, research could explore these relationships across various countries and regions, considering the unique social and economic contexts that shape climate action.

Disclosure statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability statement

All the data needed for analysis is presented within the manuscript.

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Appendix

Abbreviations	Nomenclature
COVID-19	Coronavirus Disease 2019.
Freq	Frequency
MCP	Multiple Country Publications
MCP_Ratio	Multiple Country Publications Ratio (calculated as MCP/Article Count).
NTC	Normalized Total Citations
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
R	R programming language
SCP	Single Country Publications
SDG	Sustainable Development Goal
TC	total citation
TC per year	Total citation counts per year
WoS	Web of Science