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# A Systematic Literature Review of Inclusive Climate Change Adaption

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**Abstract:** Inclusive approaches have been applied in many areas, including human resources, international development, urban planning, and innovation. This paper is a systematic literature review to describe the usage trends, scope, and nature of the inclusive approach in the climate change adaptation (CCA) context. We developed search algorithms, explicit selection criteria, and a coding questionnaire, which we used to review a total of 106 peer-reviewed articles, 145 grey literature documents, and 67 national communications to the United Nations Framework Convention on Climate Change (UNFCCC); 318 documents were reviewed in total. Quantitatively, the methodology reveals a slight increase in usage, with a focus on non-Annex 1 countries, gender issues, and capacity building. Qualitatively, we arranged the key insights into the following three categories: (1) inclusion in who or what adapts; (2) motivating inclusive processes; and (3) anticipated outcomes of inclusive CCA. We conclude, with the observation, that many issues also apply to Annex 1 countries. We also argue that the common language nature of the word 'inclusive' makes it applicable to other CCA-relevant contexts, including government subsidies, science policy, knowledge integration and mobilization, performance measurement, and the breadth of the moral circle that a society should adopt.

**Keywords:** climate change adaptation; climate justice; inclusiveness; national communications; systematic review



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## 1. Introduction

Climate change adaptation (CCA) designates the process of adjustment to actual or expected climate effects, intended to avoid harm or exploit beneficial opportunities [1]. Successful adaptation requires an approach in which all stakeholders are involved, to ensure that all needs will be considered and all outcomes will be just [2–4]. The terms "participation", "stakeholder engagement", "public involvement", "bottom up", and "community-based" have been referred to widely in the discourse of the adaptation [5,6]. A participatory approach to CCA has been advocated by many international organizations [1,7–9], and has been embedded in CCA policies worldwide [10–12]. The idea of inclusion is firmly embedded in this established debate.

Simply creating spaces for public participation does not ensure the broader involvement of stakeholders [1,13]. Pre-existing power asymmetries reinforce the existing privileges of some stakeholders and suppress minority perspectives [14–16]. In the case of CCA, this situation is particularly problematic, because less powerful populations are often harmed more severely by global warming. Adaptation solutions resulting from inequitable processes cannot be responsive to the needs of the weak, and adaptation outcomes often fall short in the criteria of equity, fairness, and justice [17,18]. In addition, the interests of future generations and of sentient non-human animals are often underrepresented. Scholars have described this situation as "non-inclusive participation", "adverse inclusion", or "limited inclusion" [19–21]. Applying the goal of inclusiveness as applied to opportunities, needs, risks, benefits, costs, and profits is even more ambitious than addressing the challenge of participation.

The concept of inclusion was popularized in classical social science research, with the ideas of social inclusion and an inclusive society [22,23]. In recent decades, it has been reconceived by researchers and policy makers to apply to contemporary issues, including inclusive growth or development [24,25], inclusive/exclusive governance or decision making [26,27], inclusive cities or urbanization [28–31], and inclusive innovation [32–34]. In these contexts, it is of the utmost importance to realize that inclusion is a universal value, referring to the right of people to access regular things and participate in mainstream society. Besides, inclusion opens a new way of thinking that influences our beliefs and actions. Inclusion is about people gaining social acceptance, having positive interactions with their peers, and being valued for who they are [22,23]. As such, it must be internally motivated and caused by embracing the belief that all people have both the right to belong and the responsibility to respect the right of others to belong [22]. Inclusion values diversity and provides real opportunities for people (both with and without disabilities) to improve their lives [24,27,31].

The interest in inclusive approaches to climate change began some time ago [2,15,35,36]. However, there has been no coherent understanding of what form this inclusion should take [6,37]. There is a need for both conceptual and empirical work on the issue of inclusive CCA. This literature review contributes to this work. We refer to 'inclusiveness' throughout this text, because it is more commonly used than the synonymous 'inclusivity', but the literature search covers all related concepts.

A number of previous systematic literature reviews have specifically focused on CCA, including characterizing adaptation actions [38,39], governance of adaptation [40], and adaptation in different locations or sectors [41,42]. However, there are no reviews focusing on the inclusiveness of CCA. The purpose of this literature review is to systematically chart the usage of 'inclusiveness' in the CCA context. We believe that it is a useful concept that can complement related ideas, such as climate justice, equity, participation, respect for diversity, bias, and discrimination.

Multiple perspectives on inclusiveness flow into the issue of climate justice that gained momentum in the late 1990s [43]. There are several definitions of climate justice, and they often express the idea of (a lack of) inclusiveness. Hughes [44] (p. 51, our emphasis), for example, proposes the following three criteria for climate justice: 1. representation of vulnerable groups in adaptation planning processes; 2. priority setting and framing that recognize the adaptation needs of the vulnerable groups; and 3. impacts of adaptation that enhance the freedoms and assets of vulnerable groups. The Routledge Handbook on Climate Justice has put the need to embrace equity and inclusiveness at the core of the discussions on climate justice and how it can be achieved [43]. Many existing studies on issues of inclusiveness in CCA planning and policy-making processes posit that adequate representation and participation of the most marginalized and vulnerable—in both developed and developing countries—will yield more recognition, procedural justice, and distributive justice, which inter alia can define climate justice [45–49].

To address the climate emergency that has recently entered mainstream debates, scholars are reconceptualizing climate justice in a more inclusive way, advocating for the reemergence of intra-generation justice and multispecies justice. This is a conceptual expansion of the use of the term, decentering the human and recognizing the human relationship with other inter- and intra-generational people and more-than-human beings [50–52]. More inclusive approaches move the climate justice discourse into multi-temporal and multi-scalar realms. In the context of CCA, this scope delineates what systemic transformations may involve (and with whom), how to adapt to inevitable and possibly intolerable losses, and how to prefigure and enact alternative and just futures.

Our present interest in exploring the 'inclusiveness' concept more deeply is two-fold. First, it is an integral part of "EDI" (equity, diversity, inclusion), which is increasingly important in various contexts. The integration of EDI into the daily life of public servants, academics, and employees of non-government organizations makes it hard to ignore. Second, and ultimately more important, is the great versatility of the common language

concept 'inclusiveness'. It is understood without great theoretical background or metaphysical justification. Additionally, it is applicable to a wide and growing range of relevant contexts, as we will show.

We use the methodology of systematic literature reviews because it provides a transparent, reproducible and rigorous approach to dealing with large information sets [53]. This approach provides quantitative results, such as trends and numerical comparisons, as well as a systematic input into summaries and analyses [38,54]. Because it is systematic, it is also constrained. The search algorithms define what may be included, and the questionnaire for data collection defines how the analysis is structured [41,42]. The upside is that the greater transparency and reproducibility of the search render future updates very feasible and improve the disclosure of the value judgments made by us. The downside is that it limits on snowballing and the search for the best references to support the emerging story. We cover the most current peer-reviewed literature, grey literature, and policy documents, with 318 documents in total.

In this paper, we deal with the following two main research questions: (i) How has the concept of inclusive CCA been used in the literature? (ii) What are the main components of CCA proposed in the literature? In order to answer these questions, we will describe the data selection, collection, and analysis (Section 2), demonstrate the trend of using this concept in the literature (Section 3), reveal a framework of inclusive CCA (Section 4), argue for the importance of this concept in the national adaptation climate change policy of both developed and developing countries (Section 5), and conclude our paper by discussing the concept's main contributions, limitations, and recommendations for future research.

## 2. Materials and Methods

A systematic review refers to a focused review of the literature that seeks to answer (a) specific research question(s) using predefined eligibility criteria for document selection and explicitly outlined and reproducible methods [38,53,54]. Systematic reviews have been increasingly used in the environmental change research context [38–42,55,56].

### *2.1. Data Selection*

The following three data sources were used: the peer-reviewed literature, grey literature (reports by consultants, governments, and NGOs), and national communications (NCs) to the United Nations Framework Convention on Climate Change (UNFCCC).

For *peer-reviewed articles*, we used the following search query in Scopus (https://www.scopus.com/) (accessed on 22 May 2021):

TITLE-ABS-KEY (inclusi* AND ("climate chang*" OR "changing climate" OR "climate warm*" OR "warm* climate" OR "global warm*" OR "global chang*" OR "environment* chang*" OR "environment* warm*" OR "warm* environment") AND (adapt* ORinterven*)) within the following subject areas: environmental science, social science, earth and planetary science, art and humanities, and multidiscipline.

A total of 614 articles were retrieved for title and abstract scanning to select papers with clear relevance to CCA and inclusiveness. Based on the inclusion/exclusion criteria (see Table 1 and Figure 1, below), 106 documents met the final relevance screening criteria and underwent data extraction.

This review also gives extensive consideration to *grey literature* and policy documents because restricting a review to only peer-reviewed literature can miss key trends and insights with significant implications for biasing the results [38,53]. Relevant grey literature was identified using the following focused search in Google:

("climate change" OR "changing climate" OR "global warming" OR "environmental change") AND ("adapt" OR "adaptation" OR "intervene" OR "intervention") AND ("inclusive" OR "inclusion" OR "inclusivity" OR "inclusiveness") filetype:pdf. We restricted included documents to PDF files only to limit hits to a manageable number. The titles and descriptions provided within the standard Google search engine were reviewed to determine the relevance of each result.

**Table 1.** Inclusion and exclusion criteria for document selection.

| Inclusion Criteria | Exclusion Criteria |
| --- | --- |
| Text in English | Text in other languages |
| Full text available | Only abstract or partial text available |
| Human response to climate change | Biological response to climate change |
| Adaptive response to climate change | Vulnerability, mitigation only |
| Refers directly to inclusiveness | Does not refer to inclusiveness |
| Sufficient detail for data extraction | Insufficient detail for data extraction |

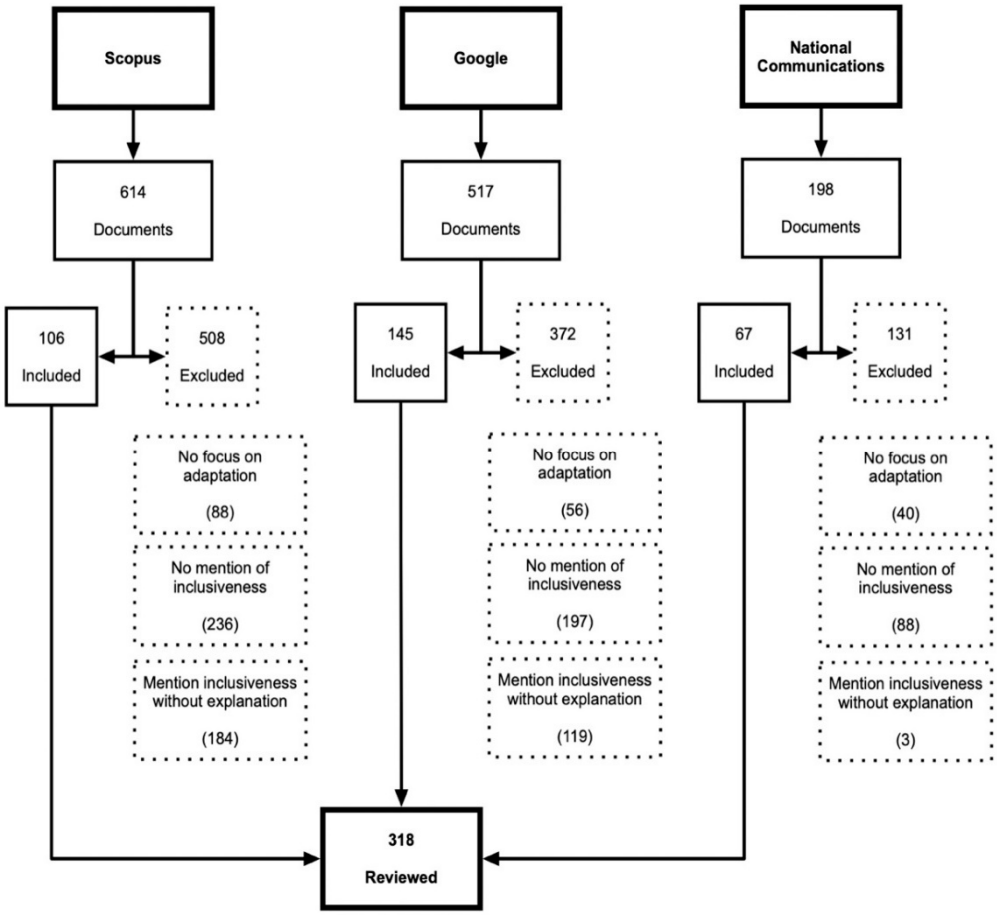


**Figure 1.** Document triage process.

A total of 517 search results met the initial screening (Mendeley has been used to remove duplicates compared to the Scopus search). A first page screen, followed by a full-text review, was applied to confirm eligibility using inclusion/exclusion criteria, and a total of 145 grey literature documents were retained and included for data extraction.

For *policy documents*, the most recent national communications were selected as the data source for this analysis. The NCs were considered the most appropriate data source for several reasons. First, national governments play key roles in adaptation planning and implementation by protecting vulnerable groups, supporting economic diversification, providing information, creating policy frameworks, making laws, and distributing financial support [1,57–60]. Second, NCs constitute a consistent source of English language information available for many developed and developing countries [42]. Third, national governments submit these documents to report their policy priorities and progress, which renders them official records [53].

A total of 198 NCs were extracted from the UNFCCC website, including 44 NCs of Annex 1 countries (NC6 reports of the US and Ukraine and NC7 reports of others), and

the 154 most recent available NCs submitted by non-Annex 1 countries (the NC of Libya was not available). Annex 1 of the convention lists developed countries and economies in transition, whereas non-Annex 1 parties are mostly low-income, developing countries. All the reports were screened based on the inclusion and exclusion criteria, and a total of 67 NCs (22 from Annex 1 countries and 45 from non-Annex 1 countries) underwent data extraction.

### *2.2. Data Collection and Analysis*

Following document screening, 318 articles from all three data sources (peer-reviewed, gray, and NC) were retained for full review (Figure 1, above). Peer-reviewed and grey literature were reviewed in full, while NCs were reviewed only where they concerned adaptation.

To achieve greater consistency, we developed an article review questionnaire (see Table 2, below) documenting how inclusive CCA is understood and occurs in the selected articles [39,53]. The general characteristics of the article in terms of authorship, year published, region of interest, and (conceptual/practical) approach provided a foundation for the quantitative portion of the systematic literature review. To support the qualitative portion, we structured the analysis of the literature by separating three themes, inspired by the adaptation assessment frameworks proposed by Smit and Pelling [4,61,62], as follows: (1) who or what adapts; (2) how to adapt (adaptation activities and adaptive capacity required to adapt); and (3) adaptation outcomes. Data were entered into a Microsoft Excel spreadsheet for descriptive statistics on quantitative trends.

**Table 2.** Questionnaire for data collection.

| **General Questions** | | |
|---|---|---|
| Lead author? | | |
| Year published? | | |
| Region of interest: | Annex 1?<br>Non-Annex 1? | |
| Approach: | Conceptual?<br>Practical (Example or Case)? | |
| **Specific questions** | | |
| **Who or what to include** | | |
| Scale: | Local and community?<br>National?<br>Regional?<br>International scales?<br>Necessity to cooperate across scales? | |
| Stakeholders: | A broader spectrum of actors? | Local people and local communities?<br>Governments, including local and national levels?<br>The private sector?<br>Experts and research communities?<br>NGOs and civil society?<br>International actors, networks, and agencies? |
| | Vulnerable groups? | The poor?<br>People with disabilities?<br>The indigenous?<br>Women and girls?<br>Resource-dependent people? |
| | More than human–others? | |

**Table 2.** *Cont.*

| Specific questions | |
|---|---|
| Knowledge: | Traditional?<br>Expert? |
| Techniques or tools: | Participatory (action) research approaches?<br>Qualitative scenarios?<br>A programming model?<br>Adaptation design tool?<br>Social ecological inventory (SEI)? |
| **How to include (adaptation activities and capacity required to adapt)** | |
| Governance?<br>Institution?<br>Social capacity? | |
| **Outcomes** | |
| Consideration of the vulnerable groups?<br>Adequate participation?<br>Just results?<br>A status of resilience, inclusive development, and sustainability? | |

## 3. Usage of Inclusiveness in Climate Change Adaptation

### *3.1. Growing Usage*

Of the 318 reviewed documents, only about 10% (29) date back to 2010 or earlier (see Figure 2, below). Ninety percent of the reviewed documents are dated 2011–2020, with an increasing trend that may have peaked in 2018. The data for 2021 are incomplete and only represent the first quarter—an extrapolation to the full year would lead to the same number as in the peak year 2018. We should note that an increase in the usage of "inclusive climate change adaptation" will likely be in line with any increase in the usage of the broader term "climate change adaptation".

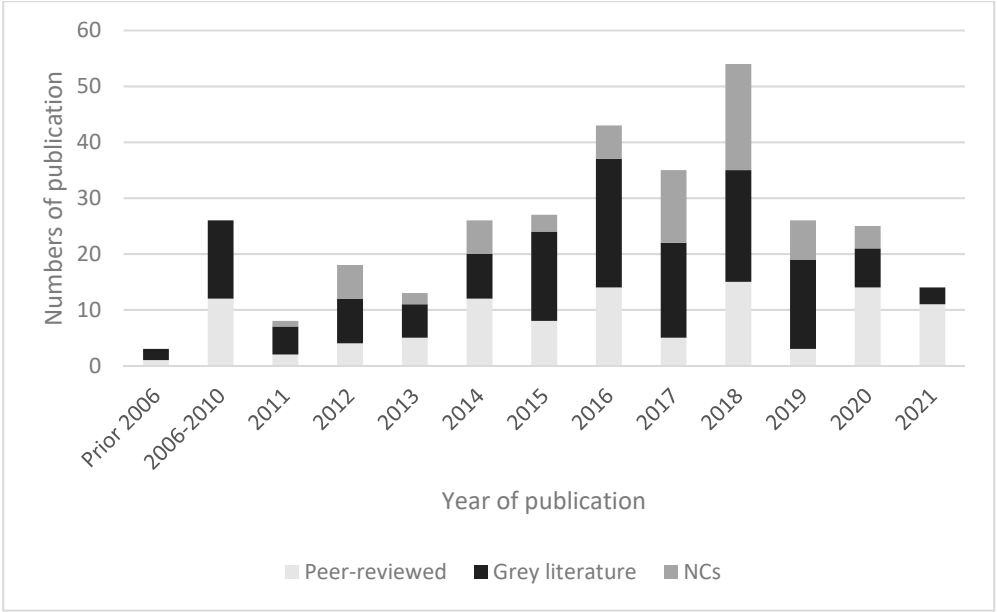


**Figure 2.** Number of publications by year.

### *3.2. Predominance of Practical Contexts*

We used the following definitions to distinguish practical and conceptual contexts. Practical approaches include substantive reporting or discussion of an adaptation activity

in place, excluding proposed strategies, empirical testing, and predictive modeling [39]. In contrast, conceptual approaches specify sequential relationships and feedback for adaptation processes in general, or for sectors or applications, providing the framework or structure for research, analyses, or modeling [62].

As shown in Figure 3, below, we categorized nearly two-thirds (199/318) of the reviewed literature in the practical category. This is agreement with Agrawal [63] and Oulu [59], who conclude that climate change adaptation is still a relatively new field, in which policy and practice tend to precede theory or advance simultaneously. They also argued that the lack of middle-range adaptation theories and comparative empirical studies is a glaring challenge. The results in Figure 3 may indicate that conceptual work in inclusive climate change adaption is lagging behind the progress made in practical research.

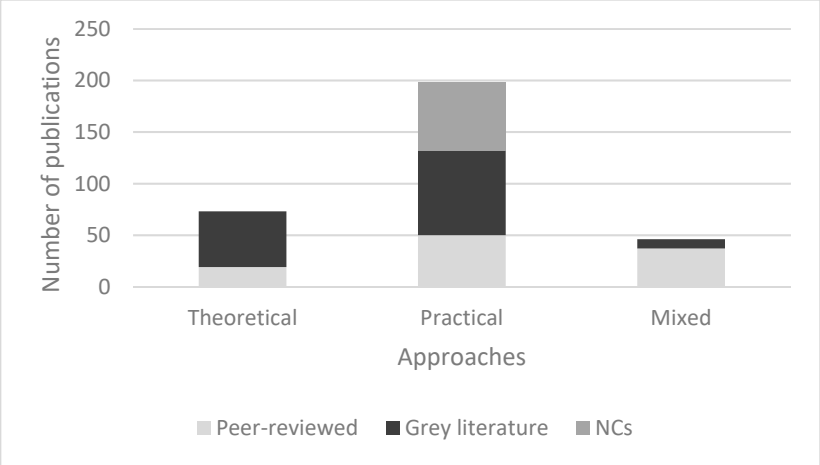


**Figure 3.** Theoretical vs. practical approaches.

Practical approaches include substantive reporting or discussion of an adaptation activity in place [39]. In other words, practical approaches describe cases or examples of how adaptation inclusiveness is happening in practice. This study is intended for a wide audience of development and CCA practitioners, to support their daily work. Moreover, the findings and good practice principles on inclusive CCA create good opportunities for researchers to test and complete the related theoretical issues that have not been well developed yet, and have applications extending well beyond the CCA field. Out of 199 documents using practical approaches, we identify 331 cases and examples. The following part presents some findings from our review of the cases and examples on inclusive CCA.

### *3.3. Predominance of Gender Issues*

As shown in Figure 4, below, more than 43% (144/331) of the cases or examples in the reviewed literature are related to gender issues. Less than 20% referred to other vulnerable groups, such as the poor, people with disabilities, the indigenous, resource-dependent people, future generations, or non-human actors.

The significance of gender issues in adaptation inclusiveness can be explained in several ways.

First, vulnerability to climate change is not gender neutral. The inequitable distribution of rights, resources, and power increases the vulnerability of women, as do social rules and norms. Women often find themselves in a vicious cycle, in which limited access to resources amplifies their susceptibility to climate change, and vice versa [16,64].

Second, the terms "gender-inclusive adaptation" and "gender-responsive adaptation" have been used regularly by UN organizations and international donors, including UNDP, UNEP, UNFCCC, GCF, and ADB [65–70]. These organizations have developed very detailed toolboxes or checklists on how to integrate gender and climate change into

policy and practice, and have encouraged all countries to integrate gender into national communication reporting [71–74]. This approach to CCA directly addresses the issues of gender inequality, provides strengthened supports to women, empowers them, and places them at the center of CCA processes. Better support to these groups would help to prevent further depletion of their resilience to climate change, and ensure that climate change does not accentuate or perpetuate existing gender inequities [75].

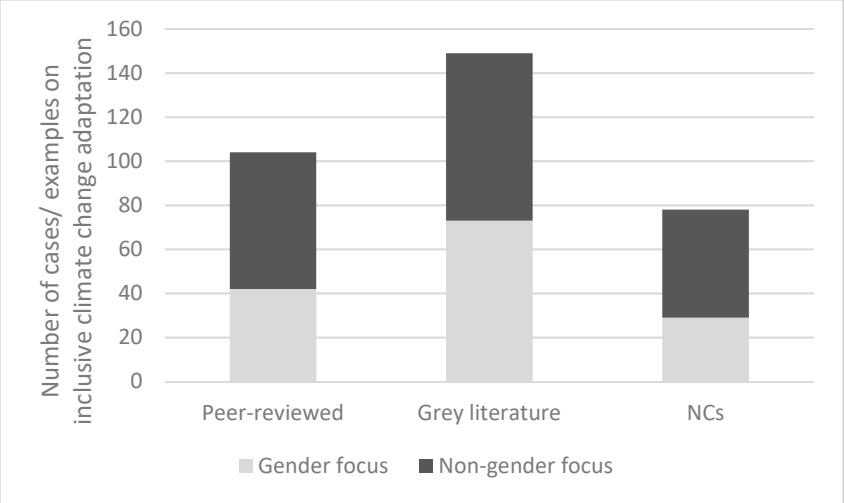


**Figure 4.** Cases with gender or non-gender foci.

### *3.4. Predominance of Non-Annex 1 Countries*

In the CCA context, it is common to use the UNFCCC's classification of parties as "Annex 1" and "non-Annex 1" countries. As shown in Figure 5, below, nearly three-fourths (267/331) of the examples and cases originated in non-Annex 1 countries. As clarified by the UNFCCC, non-Annex 1 countries are mostly low-income, developing countries, while Annex 1 lists industrialized countries and economies in transition.

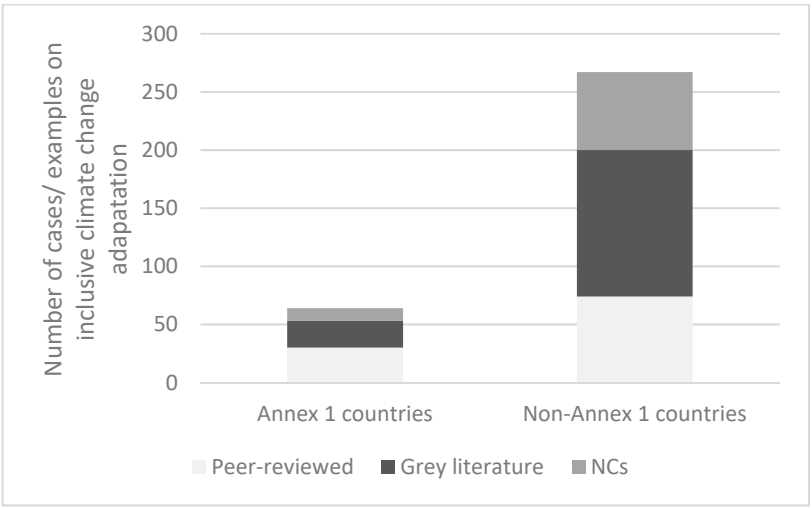


**Figure 5.** Cases in Annex 1 and non-Annex 1 countries.

Resurrección et al. [76] found similar results when conducting a review of the relevant peer-reviewed research and grey literature on gender and CCA, leaning more towards adaptation contexts in the global south, due, in large, to the availability of the literature. Populations that lack the resources for planned migration experience greater exposure to extreme weather events, particularly in developing countries with low income. Climate

change can indirectly increase the risks of violent conflicts, by amplifying well-documented drivers of these conflicts, such as poverty and economic shocks [1].

### *3.5. Inclusiveness at the Intersection of Development, Gender and Capacity in National Communications*

The non-Annex 1 countries considered inclusiveness to be a target/an aspiration. A group of countries (Bangladesh, Dominica, Belize, Indonesia, Kyrgyzstan, and Moldova) referred to inclusiveness in CCA as a broad-based strategy to empower every citizen or all stakeholders to participate fully and benefit from the adaptation process. In contrast, some countries emphasized the inclusion of related stakeholders in the adaptation process, such as local communities (Equatorial Guinea), the private sector (Fiji), multiple government entities (Jamaica), or the most vulnerable segments of the society (Namibia, Pakistan).

Another group of non-Annex 1 countries uses 'inclusiveness' in the context of CCA education. Efforts should be undertaken to develop materials and promote teacher training that is focused on climate change, linking education and awareness of climate change (Antigua and Barbuda, Bangladesh, Kuwait, Laos, Lesotho, South Africa).

Gender issues are at the center of inclusive CCA in many non-Annex 1 countries (Bosnia and Herzegovina, Jamaica, Nauru, Nigeria, Moldova, Tonga, Uganda). Gender inequalities intersect with climate risks and vulnerabilities, and climate change is likely to magnify the existing patterns of gender disadvantage. A meaningful adaptation or resilience-building effort would, therefore, involve the inclusion of a sex-disaggregated data management system, so gender can be mainstreamed into climate change planning and policies. In addition, there are capacity-building initiatives aimed at bridging the gender gap, by empowering women in climate change responses.

In NCs from Annex 1 countries, inclusiveness commonly focused on international development activities. According to the principle of forward-looking responsibility that is explicit in the UNFCCC's Article 4, the developed country parties shall support the development and enhancement of endogenous capacities and technologies of developing country parties, as well as assist them in meeting the costs of adaptation to climate change's adverse effects [77,78].

Annex 1 countries also recognize the intersectionality of development, gender, and inclusiveness. For example, the US and Australia provide adaptation leadership and training to women in Pacific countries and Peru, increasing their influence in driving solutions for CCA in international negotiations (UNFCCC) or municipal councils. The UK and Canada give funding to protect the poorest, most marginalized people across Bangladesh, Burma, Cuba, Nepal, Kenya, and Rwanda, from adverse climate effects, through poverty reduction and inclusive economic development. Japan and the UK provide financing to encourage multiple stakeholders' inclusion in CCA action in Vietnam and Nepal.

Italy, the Netherlands, Portugal, Switzerland, and the UK support developing partners in building national, institutional, community, and household capacity, to improve the inclusiveness in CCA. The UK aims to improve planning, budgeting, human resource management, performance management, and citizen engagement in Kenya. Switzerland and the Netherlands assist North Macedonia and Mozambique in the sustainable management of natural resources, through the practical application of conservation measures. The UK supports the capacity and systems development of financial service providers that serve the livelihoods and well-being of low-income people in Rwanda.

## 4. Three Components of Inclusive Climate Change Adaptation

In the adaptation assessment frameworks proposed by Smit and Pelling [4,61,62], the following four components are commonly distinguished: (1) Adaptation to what? (2) Who or what adapts? (3) How does adaptation occur? (4) How good is the adaptation? We converted these questions to the following three components of inclusive CCA: (1) inclusion in who or what adapts; (2) motivating inclusive processes; and (3) anticipated outcomes of inclusive CCA.

### *4.1. Inclusion in Who or What Adapts*

The literature on inclusiveness in CCA focuses on local and community scales, but it also recognizes the importance of national, regional, international scales, as well as the necessity to cooperate across scales [6,18,36,79–87]. The implementation of projects conducted in a bottom-up process is normally facilitated by national policy, strategy, and, especially, financial resources directed by governments to support the local-level implementation of adaptation actions. International adaptation commitment and national adaptation strategies must be translated into local adaptation action programs and mostly implemented in the local context [88,89].

Who is included should remain a central question to be addressed in planning processes [36]. CCA calls for inclusive engagement across a broader spectrum of actors [90–95]. These stakeholders include, but are not limited to, local people and local communities; governments, including local and national levels; the leaders across administrations, ministries, and departments; experts and research communities; the private sector, NGOs, and civil society; and other international actors, networks, and agencies. Inclusive CCA favors vulnerable groups, and strengthens support of the poor, indigenous people, women, smallholder farmers, members of lower castes, and resource-dependent people [87,91,96–102]. They must be fully involved in decision-making processes for reasons of both justice and efficiency [6,75]. Some authors have considered non-humans and humans as an intimately coupled system within CCA [103–105].

Adaptation should be inclusive of both scientists and local communities, to form an integrated response to bridge traditional and expert knowledges, providing critical information that is key to the success of inclusive interventions [89]. Local forms of knowledge, including traditional knowledge, traditional ecological knowledge [83], indigenous knowledge [106], and experiential knowledge [99,107], have been highly recommended to bring a distinct and relevant point of view from vulnerable stakeholders to CCA. Conversely, scientific knowledge has many advantages, especially when attempting to understand biophysical processes at broad spatial and temporal scales.

Inclusiveness in CCA also refers to inclusive techniques or tools that range from participatory (action) research [82,108,109] to qualitative scenarios [110], inexact fuzzy multi-objective programming models, adaptation design tools, social ecological inventories (SEI), and ecological risk assessments (ERA) [111]. These approaches are means to explore the public's perception of, knowledge about, and participation in CCA [112,113].

### *4.2. Motivating Inclusive Processes*

Although participation may be encouraged by law, established institutional frameworks might be reluctant to cede decision-making power. Inclusive processes for adaptation require inclusive institutions and can only be facilitated in organizational structures that foster stakeholder involvement in management [20,75,83,100,101,114]. One example of an institution for inclusive CCA is a multilevel and multisector institutional design. The multilevel institutional arrangements consider the local context and require a focus on effective cooperation across levels [115]. Chu et al. [37,116] indicated that more inclusive planning processes correspond to higher climate equity and justice outcomes in the short term, and an emphasis on building multisector governance institutions can enhance long-term program stability, while ensuring that diverse civil society actors have an ongoing voice in climate adaptation planning and implementation.

The literature on inclusive CCA also highlights governance as a significant contribution to inclusiveness, equity, and justice [84,88]. Several models of governance have been recommended to promote inclusiveness in CCA, including polycentric climate governance, collaborative climate governance, networked climate governance, and deliberative climate governance [92,117–119]. Ayers and Huq [120], Ayers [13], and Glavovic [121] argued for the potential contributions of inclusive governance approaches in CCA, including (i) creating safe arenas for public deliberation, to enable participants to explore and develop a shared understanding of adaptation concerns and to engage in different types of knowl-

edge and knowledge claims; (ii) building a common purpose and stimulating participation in community activities; (iii) deepening the community problem-solving capacity, by improving participants' understanding and involving them constructively in community life, on a sustained basis; and (iv) facilitating intercommunity collaboration through cross-scalar and multilevel processes of authentic and inclusive dialogue, visioning, negotiation, and cooperation. Addressing risk and adapting to climate change cannot progress meaningfully without being framed in this broader governance milieu [121].

Adaptive capacity refers to the ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences [11]. While all types of capital (natural, social, and economic) are critical for building resilience and fostering adaptation to environmental stresses, inclusiveness in CCA refers mostly to social capital, defined as the value of relationships that facilitate cooperation and collective action [122]. At its core, social capital describes relations of trust, reciprocity, and exchange; the evolution of common rules; and the role of networks [14,123]. Social capital can be particularly important for promoting inclusiveness in adaptation processes to climate change threats, by enabling people to act collectively.

Lee [97] identified existing networks among community-based organizations, local groups, households, and individuals, emphasizing how these networks can bolster both farmer willingness and farmer ability to actively participate in CCA programs, provide the added benefit of increasing smallholder well-being and resiliency and adaptive capacity, and potentially contribute to adaptation inclusiveness, in terms of both broader inclusion and more just outcomes. Mittag [16] and Keessen et al. [124] related the concept of adaptation inclusiveness to the social norms of functioning communities, especially a sense of solidarity. Adaptation to climate change can be an inclusive and collective, rather than individual, effort [125]. Solidarity addresses how different actors can constructively work together to promote the resiliency and adaptation of a social system. The other factor of social capital that is strongly linked to inclusiveness in adaptations is place embeddedness or person–place bonds in local contexts [126]. Place identity contributes to shaping social values at a collective level, and opportunities for and/or barriers to collective action based on shared or divergent understandings of place. Person–place bonds can influence an individual's willingness to become engaged in collective climate change initiatives. The attempt to recognize and incorporate place identity into dialogue and decision making around adaptation will increase public participation, and foster trust between those engaging in planning and those impacted by decisions. When place-based meanings and values are incorporated into any planning process, the process and its outcomes become more place appropriate, as well as more relevant and useful to specific communities.

### *4.3. Anticipated Outcomes of Inclusive CCA*

The literature covered in this review highlights four positive outcomes of inclusive CCA [37,47,115,116,127].

First, the social, economic, and political interests of the poor, underrepresented minorities, and other vulnerable groups are considered in the adaptation process. This is a positive outcome from the perspective of *climate justice*.

Second, the inclusion of all interests in the adaptation process improves *knowledge collection and management*, by involving the public in framing climate risks, vulnerabilities, and adaptation priorities. This facilitates access to climate information and knowledge, and addresses existing class, gender, caste, age, and wealth hierarchies in political decision making.

Third, formal or institutionalized adaptation projects and programs achieve just *results*, benefiting the greatest number of people, especially the most *vulnerable people* in these communities.

Fourth, building on the outcomes of inclusive adaptation processes, several authors have considered inclusiveness in CCA as a component of *resilience, development, and sustainability*. Inclusiveness allows local people and communities to improve their resources and

capacity, making them more resilient [84]. Inclusiveness also fosters inclusive development, in which people's well-being is enhanced by advancing the equality of opportunity for all members of society, with attention to the poor, the vulnerable, and those disadvantaged groups who are normally excluded from the process of development [102]. Wamsler and Brink [128] referred to inclusive adaptation as a status of sustainability in adaptive and social systems. In this case, inclusiveness encourages the use of all potential adaptation measures, to ensure that all types of risk factors are addressed. A sustainable system can assist an individual, household, or community in reducing its level of risk, while maintaining or enhancing local adaptive capacities, both now and in the future, and thus not compromising the ability of future generations to meet their own needs.

## 5. Implications for National Climate Change Adaptation Policy

Most of the papers emphasized inclusive CCA in the context of developing or non-industrialized countries. There is a universal belief that developing countries are the most affected areas, and the poor in developing countries are the most vulnerable group to climate change adversity [8,11,129,130]. This belief derives from the dependence of that group on climate-sensitive sectors, such as agriculture, tourism, fisheries, and forestry; climate-sensitive infrastructure, such as houses, buildings, municipal services, and transportation networks; and limited adaptive capacity to cope with impacts [131] (p. 801). The global climate risk index 2020 found that all ten of the most affected countries during 1999–2018 were developing countries in the low-income or lower–middle-income country group. These results emphasize the vulnerability of poor countries to climatic risks [132]. Therefore, inclusive approaches should be utilized to engage and empower smallholders, women, and poor resource-dependent communities in developing countries [102].

However, the recent literature on adaptation has called attention to all vulnerable communities and the inequities arising from the uneven distribution of climate impacts, which are likely to be reflective of the conditions within developed countries. Adaptation to climate change consists of individual and collective choices that are undertaken at different levels of decision making, in the context of different social concerns and priorities, particularly the existing institutional frameworks for resources, wealth, and power distribution. All adaptation decisions thus compete for attention and resources with other pressing choices in society [133]. Adaptation is not a neutral process, but instead has equity dimensions that are part of the larger adaptive challenge of climate change, and are present in all types of countries and regions, including highly urbanized, developed countries, such as the United States, Canada, and many of the countries of Western Europe [134,135]. One highly cited example is Hurricane Katrina, which struck the United States in 2005, and the enduring legacy of racial segregation and poverty. Statistics showed that the storm's impacts weighed more heavily upon racial minorities and the poor, and the recovery of socially and economically vulnerable storm victims continues to lag behind that of mainstream society. The patterns of settlement exposed poor communities to increased damage and erected barriers to disaster precautions and reconstruction. In the other words, social and economic disparities heavily affected the impacts of Katrina on the most vulnerable groups, especially African Americans and the poor. Climate change impacts are expected to exacerbate poverty and create new poverty pockets in countries with increasing inequality, including developed countries [1].

Inclusive approaches to adaptation address gender inequality (for women), income inequality (for the poor), minority groups (for example, indigenous people), and underrepresented, disfavored, or marginalized groups (for example, communities of color, refugees, migrants, and the stateless). These groups clearly exist and are even growing in developed countries, due to the global economic crisis and recent migrant crisis. Involving less advantaged people properly in adaptation processes has been urgently required, not only to address human rights issues, but also to ensure the sustainable prosperity of industrialized nations. Therefore, the necessity of inclusive approaches emerges not only in developing countries, but also in industrialized countries [104]. However, inclusive approaches vary

significantly in different contexts, due to the different characteristics of economic, social, and political systems.

## 6. Conclusions

The purpose of this literature review was to systematically chart the usage of 'inclusiveness' in the climate change adaptation context. 'Inclusion' has been gaining in interest and usage in several other contexts, in particular, human resources (EDI), as well as urban planning, international development, and innovation. A clear interest is also reflected in this literature review, although our quantitative analysis does not indicate a steep or consistent increase in usage. This review has shown common usage of the term in practical contexts, particularly development, knowledge mobilization, gender issues, marginalization, and poverty.

The common connotation of the word 'inclusion' is very broad and goes beyond public participation and even the idea of justice. Following the typology of CCA, provided by Smit et al. [62], the inclusion lens could be applied to all aspects of climate change and climate change adaption, as follows: (1) inclusive identification of the causes of CC; (2) inclusive identification of the effects of CC; (3) inclusive goals and processes of CCA; and (4) inclusive evaluation of CCA. The word can be used to diagnose both omission (neglect) and commission (discrimination) in a wide array of contexts, including subsidies for knowledge creation (science policy), processes during knowledge creation (HR), the translation of knowledge, the availability and accessibility of knowledge, the use of knowledge, the beneficiaries of providing solutions, the measurement of performance, the beneficiaries of providing performance measurement, corrective actions, and so forth.

Inclusion is also a central idea within the circle of moral attention that has historically widened. Over time, in western history, policies have been enacted, to include into the moral circle slaves, different races, women, sentient animals, and endangered species. Inclusive approaches to CCA could be used to emphasize the important role of the natural environment in adaptation and assessing the potential outcomes of human climate adaptation for the natural environment. Many societies have traditionally treated climate as a background for human activities, and climate change as an environmental problem or development issue, in which human beings attempt to stimulate, take advantage of, or harmonize with the non-human world. Inclusive adaptation, thus, provides a suitable intellectual framework and connotation to include non-anthropocentric viewpoints in debates and policy development.

Possibly the greatest value of 'inclusiveness' lies in the fact that it is a fairly clear, common language word. Compared to words such as 'justice', 'participation', 'equity', or even 'community' and 'democracy', it has relatively little metaphysical content. This makes it suitable for checklists and indicators for all policies and activities associated with CCA. Do we live up to the goals and promises of justice, impartiality, non-discrimination, equity, and diversity? If we consider inclusiveness, then we are off to good start.

We conclude this paper by discussing the limitations and suggestions for future research. One limitation lies in the data collection. In particular, we limited our search to documents in English that exclude the usage and understanding of inclusiveness expressed in non-English documentation. An artefact of the systematic method used here is that the uniformity and clarity of results is lower when compared to literature reviews that rely on cherry-picked sources. Future research will focus on broader conceptual analyses that are based on comparisons with other contexts, such as urban planning, innovation, and education. This broader conceptual understanding will then be applied to real-world case studies. The ultimate goal is to better understand the conditions and incentives that promote inclusiveness and climate justice.

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