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Intersectional Climate Change Adaptation

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1 In the common elaboration of this report, coordinated by Lydia Pedoth, Adriana Recalde Martínez has written sections 4.1 and 4.3; Lydia Pedoth section 3; Alexandra Tomaselli sections 4.2 and 5; sections 1 and 2 have been compiled by all authors; and sections 6 and Annexes 1 and 2 by Adriana Recalde Martínez and Alexandra Tomaselli. Virginia Vergara is the author of all the graphic elaborations.

Content

1 Introduction

Climate change is one of the most pressing global challenges of our time, yet traditional approaches to climate research face significant hurdles, including limited data accessibility, uncertainties in predictive modeling, and the complexity of integrating diverse socio-economic and environmental variables into comprehensive analyses. In particular, while it is recognized that climate change poses severe risks to the current and future fulfillment of a range of human rights, and that its impacts can exacerbate existing social inequalities (Burger & Wentz, 2015), traditional climate research often generalizes the impacts of climate change without fully considering how social factors such as gender, ethnicity, race, age, disability, socioeconomic status, and others interact and create unique situations of vulnerabilities and oppressions (Amorim-Maia et al., 2022). This includes not only the direct impacts of climate change but also the actions implemented to address them, such as climate adaptation strategies.

Against this background, the ASCEND project has tried to examine climate justice approaches and dynamics through the lens of intersectionality, by pursuing the objectives of integrating climate justice principles with concepts of vulnerability, climate resilience, socio-ecological transformation, and others, highlighting intersectional perspectives—including gender, minorities, youth, and migrants—in local climate change adaptation planning, and fostering greater awareness of the intersectional dimensions of climate justice.

Within this framework, this report specifically addresses the second of such objectives and aims to collect, evaluate and discuss research and policies covering how states, regions, cities, or other types of communities (outside of South Tyrol) have tried and failed or succeeded to integrate gender, minority, youth and migrants' perspectives (or some of them) and/or have applied an intersectional lens into their adaptation plans. The ultimate scope is to learn from these cases and promote cross-fertilization for South Tyrol. Therefore, this report deliberately focuses on those cases that have either directly or indirectly adopted an intersectional approach (see below section 4).

Hence, this report is organized as follows. Section 2 introduces what intersectionality means and implies and how climate research and policy has or has not adopted or integrated such an approach. Section 3 illustrates the methodology of this report, while section 4 presents the results. Section 5 offers some lessons learnt for South Tyrol, followed by some concluding remarks (section 6). Finally, a short glossary of the social factors that we had either pre-identified or that emerged during the analysis and that intersect in the case studies, as well as the full list of cases are annexed.

2 Intersectionality and climate change research and policies

Intersectionality (Collins, 1990; Crenshaw, 1991) originates from critical race theory and examines the interplay of social factors that shape complex inequalities, interact with power structures, and may thus create layered oppression for individuals at the intersections of factors such as gender, ethnicity, age, disability, and socioeconomic status (Pilcher & Whelehan, 2017). An intersectional approach to climate research thus provides a nuanced framework that acknowledges how overlapping social identities and power structures and systems may influence individuals' and communities' experiences of climate change (Amorim-Maia et al., 2024). For example, low-income, minority, or indigenous peoples may face compounded risks due to historical and ongoing economic, social, and political disadvantages. This exacerbates further in case of other intersections, e.g., considering women, youth or elderly people (McArdle, 2021; Friedrich, 2023).

Also, integrating intersectionality into climate research encourages the inclusion of diverse voices in decision-making processes. Indeed, an intersectional approach may collect and make visible the diverse and overlapping social, economic, and environmental factors shaping climate vulnerabilities. Therefore, a participatory framework becomes essential to ensure that the voices and experiences of marginalized and underrepresented groups are meaningfully included in the development of equitable and effective climate solutions and that those who are most affected by climate change have a say in shaping the policies and practices intended to address it (McArdle 2021; Friedrich 2023).

Intersectionality also helps to avoid reinforcing stereotypes and burdens that may come from well-meaning but oversimplified solutions. For instance, programs focusing solely on women as primary caretakers in environmental efforts might perpetuate gender roles without addressing the underlying social conditions that restrict women's choices. By applying intersectional thinking, climate research can support more balanced and transformative solutions (Macpherson et al., 2024).

Therefore, intersectionality enriches climate research by exposing hidden dynamics and promoting strategies that are inclusive, equitable, and effective. It shifts the focus from generalized impacts to the complex, interwoven realities of social power and vulnerability, ensuring that climate action does not leave anyone behind.

In the same vein, by understanding that different groups experience climate impacts in varied ways, intersectional analysis helps in designing adaptation and mitigation strategies that are better tailored to address the specific needs of marginalized communities. In addition, such an approach can also consider agency, thus the strengths and the experiences they have had, as well as the coping strategies that such communities may have already developed, for example, individuals with a migration background who have already experienced natural hazards such as floods or heat waves in their countries of origin. This ensures that policies are not one-size-fits-all but rather inclusive and effective for our diverse populations. An inclusive approach to the development of policies is also of great importance for their implementation, as this makes the policies better known, accepted and more likely to be implemented and translated into concrete actions, and only in this way climate change adaptation (hereinafter referred as CCA) can succeed in practice, with everyone actively participating in their own way.

In this regard, it is important to highlight how different international institutions and agencies are gradually adopting the notion of intersectionality. As it is generally assumed that the EU's climate adaptation policies aim for fair and just transitions (European Environment Agency, 2024a) a total of 16

instruments, policies, programs and laws2 were analyzed to assess the progressive incorporation of an intersectional approach. While the term 'intersectionality' was initially rare in EU legislative language (Debusscher & Maes, 2024), a tentative effort can be seen in the EU Strategy on Adaptation to Climate Change, which requires that any claim to local, individual and just resilience takes into account that climate change impacts are not neutral, but "men and women, older people, disabled people, displaced or socially marginalized people have different adaptive capacities"(European Commission, 2021a, p. 11).

An important step forward was taken with the adoption of the first European Climate Risk Assessment (European Environment Agency, 2024a) in which a meticulous identification of vulnerable people brought into the debate not only the young, the elderly, women, the disabled or those with low incomes (European Environment Agency, 2023) but also immigrants, people in poor health, those with limited social networks, ethnic minorities or indigenous peoples (European Environment Agency, 2024a). These social vulnerabilities intersect with specific spatial characteristics, such as low-lying areas, certain remote and rural regions, and livelihoods or areas that are more exposed to air pollution. The essence of that report is to move away from fixed markers of vulnerability while providing some distinctions related to group-based, gender-based, socio-economic and occupation-based, age- and health-based vulnerabilities. It is through an intersectional lens that issues, such as the failure to recognize indigenous Sámi interests, traditional knowledge or specific perspectives in northern Europe, the fact that women are generally less able to swim due to social norms, have more family caring responsibilities or fewer education/training opportunities than men, the climate exposure of outdoor workers in agriculture, immigrants' lack of access to citizenship or the climate anxiety of young people, can be better identified and fairly addressed in terms of climate adaptation (European Environment Agency, 2024a).

As stated in the study requested by the European Parliament Committee on Employment and Social Affairs (Gancheva et al., 2023), the multiple identities and belonging to different groups may exacerbate or lessen people's vulnerability. These inequality dimensions intersect in varied and multiple ways, positioning some people at higher mitigation and adaptation risks while providing others with mitigation or adaptation privilege. There is evidence that environmental improvements, such as urban greening, carried out without consideration of, e.g., communities of lower socio-economic status, migrants and ethnic minorities, can displace existing residents. Indeed, in those neighborhoods that become 'greener', and thus aesthetically and functionally more attractive, housing costs and property values rise. This leads to the so-called 'green gentrification', that points at how peoples with lower socioeconomic status can be excluded from greenspace and thus be more exposed to climate injustice (Ambrey et al., 2017; Anguelovski et al., 2022). The same happened in the post-flood recovery of coastal communities in the Caribbean, where local populations were displaced by the so-called 'technological fixes' that increased the houses functionalities and thus their value. This allowed the arrival of wealthier settlers who were the only ones who could afford resilient housing (Gould & Lewis, 2021, p. 4). This social phenomenon is also known as what Perc (2014) called the 'Matthew effect' that flags the self-reinforcing pathways of (dis)advantage: the poor become poorer while the powerful tend to become more powerful.

While recent reports from the European Environment Agency (Lager et al., 2023; European Environment Agency, 2024b) indicate that Member States are progressively incorporating differentiated and intersecting vulnerabilities into their national climate adaptation plans and strategies, practical evidence is scarce and mostly related to the local level or mainly implemented in the Global South (Lager et al., 2023). This shows that adaptation monitoring is limited and that social outcomes of adaptation policies are rarely considered. To address this, the abovementioned study suggests that indicators of just resilience and intersecting vulnerabilities should be a further area of research (European Environment Agency, 2024b). Given that the study outlines recommendations to be taken up by the European

2 The following instruments were analyzed by looking intro intersectionality signs: The Energy Governance Regulation (Regulation (EU) 2018/1999), the EU Adaptation Strategy (COM/2021/82 final), the RED (Directive (EU) 2018/2001), the EED (Directive (EU) 2018/2002), the EPBD (Directive (EU) 2018/844), the LULUCF Regulation (Regulation (EU) 2018/841), the CEAP (COM (2020) 98 final), the Climate ADAPT: European Climate Adaptation Platform (2023), the EU Civil Protection Mechanism (2021), the Directive 2007/60/EC on the assessment and management of flood risks (2007), the Action Plan for the European Pillar of Social Rights from the European Commission (2021), the European Commission report on the support for nature-based solutions (2021), the LIFE Programme (2023), the Common Agricultural Policy (CAP), the European Green Deal (2019), and the Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the European Climate Law.

Parliament in future policy debates, we observe that the language of intersectionality in adaptation policies is indeed gaining attention and its gradual incorporation may be further enhanced.

In the same vein, the Horizon Europe program has committed to adopting an intersectional lens to achieve a more nuanced understanding of societal challenges, not only in project design, but also in funded research and innovation activities. A powerful example of this is the PLANET4B Biodiversity project (Planet4B, 2022) which emphasizes that factors such as gender, religion, ethnicity, race, age, culture and disability influence people's environmental behavior and choices. By focusing on 11 case studies in different European and global settings, and through creative, action-oriented and participatory research, the results of the project -expected in October 2025- will serve as an input to policymakers and civil society at large, demonstrating that transformative change is possible and that an intersectional lens is a necessary ally.

To foster a richer exchange of ideas, the IPCC has made a clear commitment to include an intersectional approach in its reports, which has grown significantly since the Fifth Assessment Report (IPCC et al., 2013). It is pointed out that present adaptation strategies still do not sufficiently include the underlying social determinants of human vulnerability. In fact, the intersection of inequality and poverty presents significant adaptation limits, resulting in residual impacts for vulnerable groups, including women, youth, elderly, ethnic and religious minorities, indigenous people and refugees (IPCC, 2022). Throughout the report, it is undoubtedly manifested that vulnerabilities, rather than static and fixed categories are dynamic and intersects the ones with the others. Furthermore, and in climate adaptation terms, those abovementioned vulnerabilities have a common threat; climate change is a universal driver, a multiplier of risk and a stressor that shapes the dynamic and unique livelihood trajectories (IPCC, 2022).

The intersectional approach is therefore an emerging feature of recent climate adaptation research and policymaking, although less so in the practice. As mentioned above, intersectionality promotes a better understanding of who is vulnerable, where, to what extend and why. The Sixth Assessment Report on Impacts, Adaptation and Vulnerability (IPCC, 2022) states that it is essential to go beyond the study of climate hazards (such as wildfires, floods, droughts, or sea level rise) and focus on the people affected and the factors causing and/or contributing to their vulnerability (e.g., social isolation, ethnic marginalization, low physical fitness, pre-existing disability, length of residence, or non-binary gender, etc.).

With regard to the United Nations (UN), the application of an intersectional paradigm to human rights analyses of climate change impacts is still in its infancy (Martignoni, 2018). There has been some work done on intersectionality and CCA from a socio-ecological perspective, in which the work of the Committee on the Elimination of Discrimination Against Women (CEDAW Committee), the Committee on the Rights of the Child (CRC Committee) and the Human Rights Council are particularly prominent. Specifically, the CEDAW Committee’s General Recommendation No. 37 on disaster risk reduction in a changing climate, emphasizes the need for integrated policy and legislative frameworks on climate change mitigation and adaptation by considering the diverse experiences of diverse groups of women (CEDAW, 2018, p. 2,8,23). Despite its importance, Recommendation No. 37 does not tackle those power relations that intersectionality theorists have persistently flagged.

At its end, the CRC Committee held a Day of General Discussion on children’s rights and the environment in which it took an examination of the impact of environmental harm on the rights of children in vulnerable situations. It noted the need to ensure that “children of different ages, gender and social backgrounds participate in decisions and actions to prevent, respond and adapt to environmental harm” (OHCHR, 2016, p. 1). Finally, based on the Human Rights Council’s action, the Special Rapporteurs on the Right to Food or Water and Sanitation are drawing attention to the specific impacts of climate change for rural women, small-holder farmers, people living in poverty and indigenous peoples (UN Human Rights Council, 2016; Carey, 2020). While pointing out the many benefits, it is also necessary to address some fair objections of an intersectional approach, such as the risk of weakening the collective impact of unified demands by identifying smaller sub-groups, or

skepticism about the ability of institutions and policymakers to successfully grasp the complexity of intersectional analysis (O'Brien, 2020).

While there is an ongoing debate about the usefulness of intersectionality, several international human rights mechanisms are beginning to take intersectionality into account in several contexts. Thus, and with the genuine conviction that intersectionality stands as a "radically cross-disciplinary attitude" (Martignoni, 2018, p. 398), the following idea of intersectionality will guide and inspire further debates based on this report:

"Intersectionality is a form of resistant knowledge developed to unsettle conventional mindsets, challenge oppressive power, think through the full architecture of structural inequalities and asymmetrical life opportunities, and seek a more just world" (May, 2015, p. 4).

3 Methodology

For the collection of case-studies, a bottom-up approach was chosen, relying upon the experience and expertise of the project members from various disciplines and research areas. In a second step, the collection was supplemented through targeted desktop research. This approach intentionally did not aim at achieving an exhaustive collection of examples, as it may be possible through an online database search with keyword searches. Instead, it focused on assembling a curated selection of examples that had already undergone preliminary filtering by individual researchers and are recognized as good practice examples. This limited yet targeted selection facilitated an in-depth analysis, allowing the identification of specific recommendations applicable to the South Tyrolean context.

An Excel database was created to organize and document the data, focusing on the following variables:

- Case title – Name or title of the study or project
- Authors – Authors or publishing institution
- Year – Year the document was published
- Category – Good practice, lessons learnt or both
- Type – Policy, law, strategy, study or other type of document
- Level – local, regional, national or international
- Duration – short-, medium-, long-term, finished, ongoing
- Country – geographical location of example
- Main objective – short description of the main objective of the example
- Methodology – short description of the methodology applied
- Brief assessment on the implementation with a look on inclusion gender, minority, youth and/or migrants and/or intersectionality
- CCA, climate change mitigation or both – to ascertain whether the case study including one or the other or both
- Elements for cross-fertilization for South Tyrol – description of aspects, approaches or activities that could be transferred to the context of South Tyrol.

For all the collected examples, the team filled in all the fields specified above. This resulted in a first version of the collection which was double-checked with the project researchers. In a second step, targeted desktop research was conducted to identify additional empirical examples that illustrate how concrete processes of CCA planning at the local level have considered and incorporated aspects of intersectionality and how they have implemented them on the ground. All fields of the table were also completed for these case studies, creating a dataset of 35 examples, which was subsequently used for further analysis.

The outcome of this initial phase was a table containing extensive content, some of which was presented in descriptive text form. To improve the structure of this content and facilitate more efficient searching for specific examples or aspects, we decided to create categorical variables for certain types of information. Regarding case studies' methodologies, a variable was created to classify them into quantitative, qualitative, or mixed methods. Additionally, methods were specified as a separate variable (strategy/policy review, workshop, survey, mapping, interviews, literature review).

An initial analysis of the case studies revealed that some of them presented relevant conceptual frameworks or focused more on theoretical approaches and principles regarding how intersectionality should be considered in CCA, while others provided concrete experiences and applications. Consequently, an additional variable was created to categorize the case studies into these two categories (theoretical framework/practical application).

Another insight from an initial review of the case studies indicates that they not only covered the four primary axes of intersectionality[3] that the ASCEND project pursued to investigate, that is, gender, age, migrants, and minority communities[4], but they also addressed additional dimensions, such as disability, rurality/remoteness and refugee status. Therefore, it was decided to add an additional variable encompassing all these intersectional dimensions, specifying which dimension(s) were addressed for each case study (see further below).

Finally, we noted that some case studies address the topic of climate change or CCA in general, while others focus specifically on specific climate risks, such as flooding or heat waves. This distinction was also incorporated into the table as an additional variable.

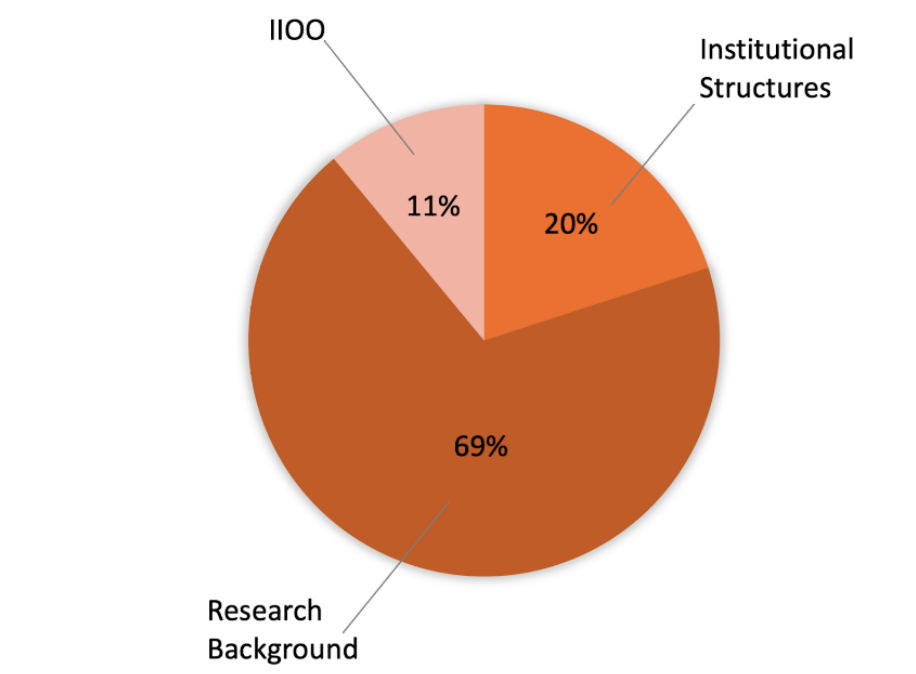
In sum, the final dataset used for the analysis consists of 35 cases and 17 variables for each case. This report includes Annex 2 with the list of cases and the main variables (case title, authors, year, country, DOI). The following two sections present the results of the analysis of the collected examples and provide a detailed discussion of four selected cases (see section 4.3) that were chosen for their significance in highlighting how an intersectional approach can lead to opportunities for a just climate change adaptation in specifically diverse geographical and socio-economic contexts.

3 In this report, we will use intersectional axis or axes and social factors interchangeably by meaning those personal conditions or those elements within society that influence individuals' behaviors, interactions, opportunities, and outcomes. These factors are rooted in the structure, norms, values, and dynamics of social systems and can have significant impacts on everything from individual well-being to societal development. Social factors often intersect with economic, cultural, political, and environmental dimensions (American Psychological Association 2018).
4 On these and the following concepts, see the Annex 1.

4 Results

4.1 Overview of the case studies

As mentioned in section 3, our sample included 35 case studies in which an intersectional approach was applied regarding CCA and/or mitigation. According to the team's categorization, from a descriptive perspective, 24 of these case studies originated from academic research, 4 were associated with international organizations (IIOO) such as the IOM, UNFCCC, or OECD, and only 7 were linked to institutional entities, including assemblies (e.g., London), municipalities (e.g., Ilam, Nepal; Carlton, Melbourne), governments (e.g., Canada or Navarra, Spain), and ministries (e.g., Vienna, Austria), see graph 1 below. This distribution suggests that research-driven initiatives may play a more significant role in the examined context, possibly due to their innovative or experimental nature, compared to more established and institutional structures that show less commitment or capacities to successfully grasping the complexities of intersectional analysis.



Graph 1: Distribution of case studies (n=35) per provenance

Moreover, 15 cases are categorized as research studies, with 9 focusing predominantly on policy research, occasionally incorporating legal research elements. Only 5 include clearly defined and measurable action plans, while a smaller portion adopt alternative formats like commentaries or mapping tools.[5]

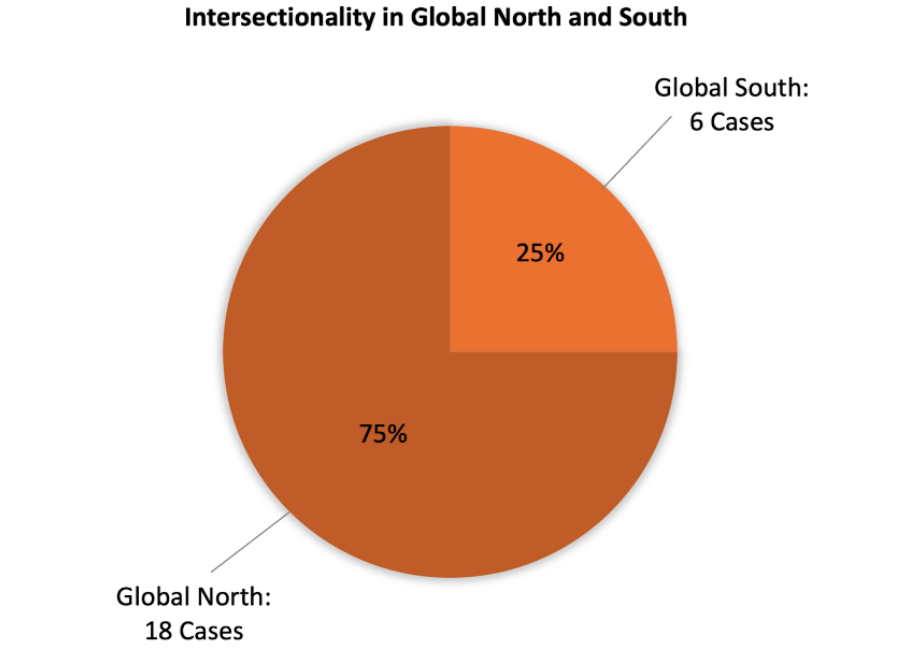
5 In particular, the Global Environmental Justice Atlas (EJAtlas) is an interactive online platform that maps and documents social conflicts related to environmental issues. Managed by a team of researchers and activists, it gathers stories from communities worldwide fighting for environmental justice. Contributed by numerous collaborators, the platform amplifies their voices, exposes injustices, and calls for accountability from corporations and governments. Additionally, EJAtlas serves as a hub for information-sharing and networking among those engaged in environmental justice movements. For further information about the initiative, see: https://ejatlas.org/. For further information about the methodology, see the following article: https://journals.librarypublishing.arizona.edu/jpe/article/id/1932/

Examining the publication timeline of the cases, we observe that earlier examples (2016, 2018, 2019) emphasize strong connections between intersectionality and gender. However, from 2021 onward, there is a noticeable shift toward exploring additional axes of vulnerability, such as those related to minority and/or migrant status and considering low-income populations. This trend reflects a growing interest in intersectional approaches, with 2023 marking a peak in article production on the subject. This increase may be due to the historical roots of feminist concerns on race, ethnicity, and migration, which fostered the application of intersectionality in continental Europe. Over time, this approach has become more firmly integrated into climate change research, policy, and law, particularly around the turn of the 21st century (Hvenegård-Lassen et al., 2020).

Indeed, intersectionality studies rank highest at the international level (13 cases) but are also well-represented at national (10), local (7), and regional (5) levels. Interestingly, while climate justice was initially a global concern raised by scholars and activists, its usage has expanded both to smaller scales and, crucially, across scales, bridging different levels of action (Mikulewicz et al., 2023). This development reflects how intersectionality and climate justice have been growing in tandem, strengthening each other as they gain prominence. In line with IPCC considerations (IPCC, 2022), the local level must receive most attention, as it takes into consideration the multiple forms of structural oppression experienced at the grassroots level.

Data highlighted that intersectional approaches were more prevalent in case studies from the Global North, where 18 cases were found, compared to just 6 in the Global South. This can be attributed to the fact that intersectionality, as a theoretical framework, originated in the academic environments of the Global North, especially within feminist and social justice studies (Collins et al., 2021). As a result, these regions have engaged more deeply with the theoretical underpinnings of how intersecting identities (such as gender, race, and socioeconomic status) impact experiences of climate change. Meanwhile, in the Global South, while climate justice remains an urgent issue, the focus has generally been on more immediate, practical solutions, driven by the pressing needs for adaptation and mitigation.

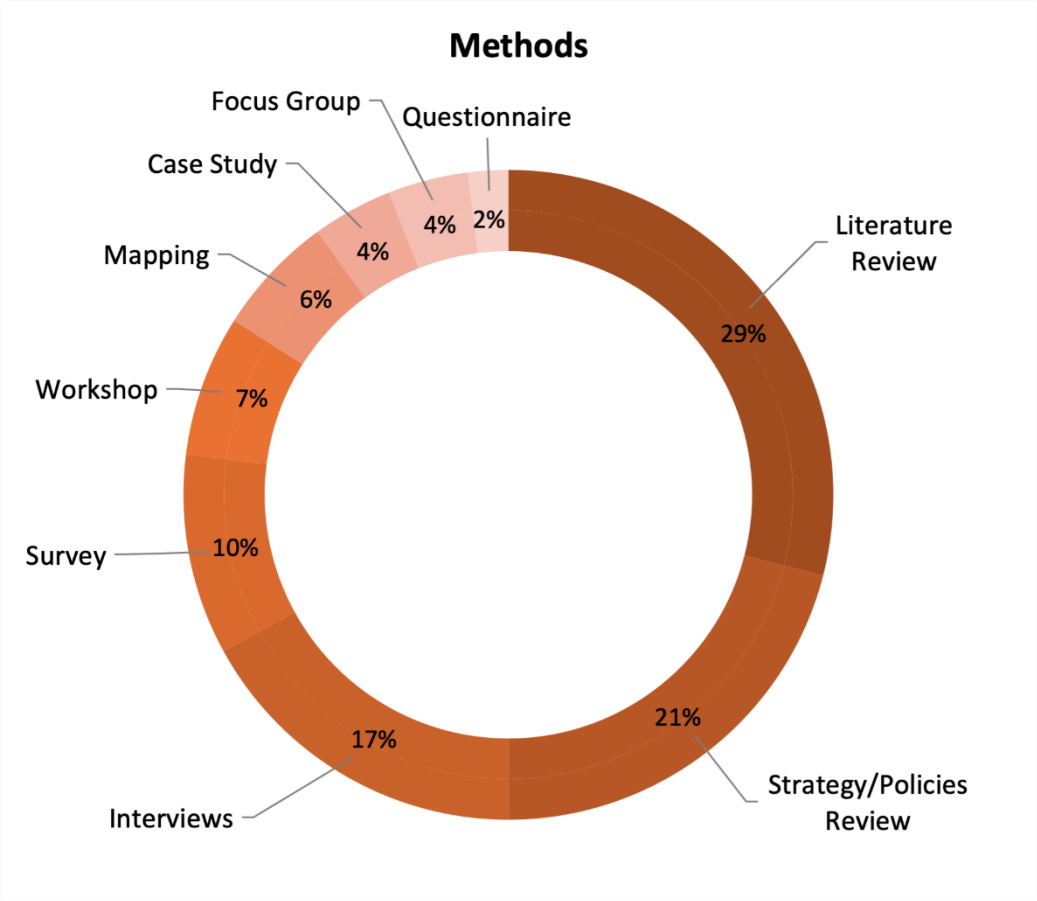
Research on vulnerability and adaptation in the Global South has typically concentrated on a single marker (usually gender) as the primary category of difference that shapes an individual's vulnerability and adaptive capacity (Thompson-Hall et al., 2016). However, there is an emerging recognition of the heterogeneous and intersecting nature of vulnerabilities in policy and research. For instance, recent Global South studies have shown that women’s adaptive capacity is influenced not only by their gender, but also by intersecting factors, such as marital status in Tanzania (Van Aelst & Holvoet, 2016) and caste-related vulnerabilities in Nepal (Becker, 2021).



Graph 2: Distribution of case studies (n=35) between Global North and Global South

In the graph 2 above, orange is used to represent countries from the Global North, such as Austria, Spain, Denmark, Canada, the UK, the US, New Zealand, the Netherlands, and Australia, while blue marks the Global South countries, including Brazil, Bangladesh, Nepal, Kenya, and India. The remaining 11 studies offer a more global perspective.

Turning to the methodology, graph 3 below, 16 of the case studies employed a predominantly qualitative approach, while 9 utilized a mixed-methods design, combining qualitative and quantitative research to explore intersectionality in CCA. With a brief exploration of the methods used, the graph can offer a clear visual representation of the most applied tools.



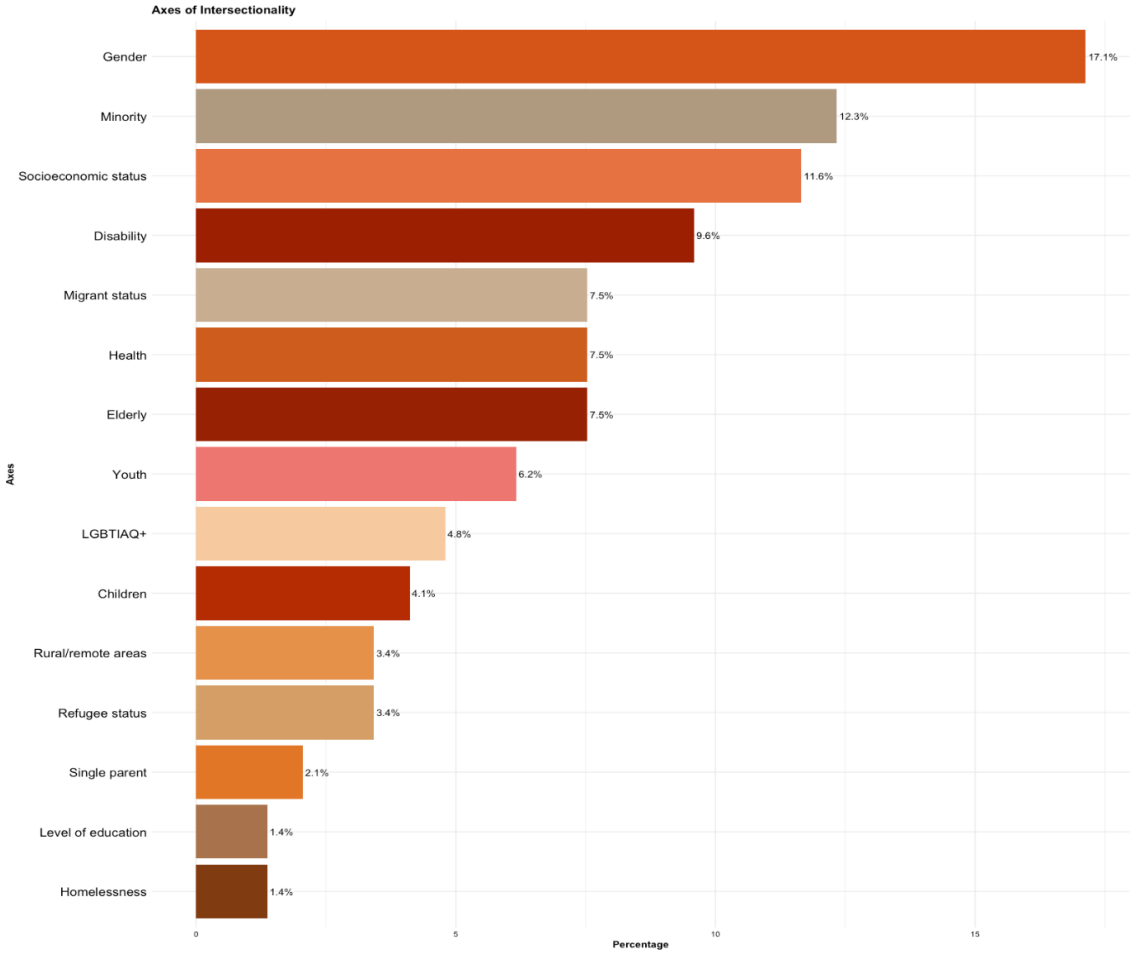
Graph 3: Research methods applied by the case studies (n=35)

In sum, in the context of CCA, much of the research focuses on documenting the lived experiences of individuals and their intersecting vulnerabilities to better understand the complexity of social dynamics, which lends itself well to qualitative methods. These perspectives and the lived experiences thus become primary sources of data. This is a defining characteristic of intersectional research, which often makes use of storytelling and oral history - methods that are particularly effective, for example, in preserving indigenous knowledge in the context of climate adaptation (Mikulewicz et al., 2023).

4.2 Results by axes of intersectionality

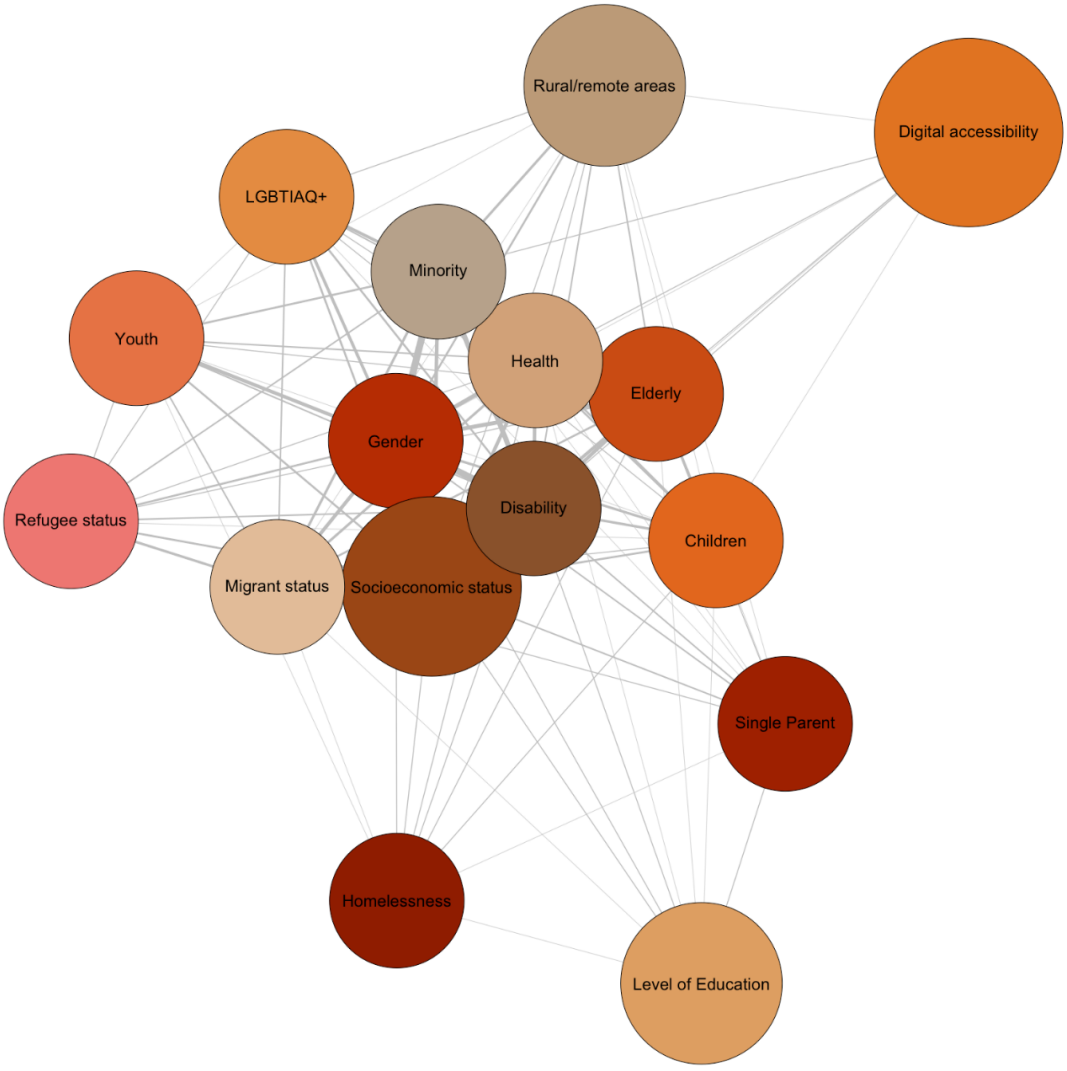
As mentioned in section 3 (methodology), while we initially and purposely decided to focus on four main intersectional axes (gender, migrant, youth, minorities), through the analysis of the collected case studies we soon realized that a focus on these social dimensions only was reductive. We observed how the case studies indicated many more potential social factors, and we thus inductively included also others, that are: socioeconomic status, disability, sexual orientation, elderly, children, health, refugee status, homelessness, single parenthood, level of education, rurality or remoteness, and digital accessibility. This is in line with the intersectional literature that signals the existence of diverse social factors that can intersect (Lutz & Wenning, 2001).

Graph 4 below shows that two of the social factors we had initially identified, gender and minority status, are the most recurrent, while the other two we had initially selected (migrant status and youth) are among the 8 most frequent intersectional axes addressed by the case studies. However, it also shows that, among the many other inductive social factors that we have found, socioeconomic status, disability, health and elderly are those who are most repeatedly considered by the selected case studies.



Graph 4: Frequency of intersectional axes addressed by the case studies

A more analytical perspective brought us to consider how the diverse array of intersectional axes eventually corelated, which is visualized in graph 5 below. We did not focus on specific intersections of social factors but on the co-occurrence of each independent social factor to see not only how often it was considered by case studies and thus stems as the most prominent but also to evaluate the social factors were connected within and among case studies. Therefore, we do not claim an intersectional analysis below but rather a visualization of the co-occurrences of the diverse social factors considered as potential intersectional axes by the case studies.



Graph 5: Connections and co-occurrence of intersectional axes in the case studies

In the graph 5 above, each node (represented as a circle) corresponds to an intersectional axis, such as “gender”, “minority (status)”, “disability”, and others. Each node (circle) acts as a visual indicator of a social factor’s prominence. Each circle is connected to the others in the network.

The size of each node reflects the number of connections it has with other social factors, known as its degree. Larger circles indicate intersectional axes that are more interconnected (e.g., "gender" is a larger node because it is frequently connected to many other social factors, suggesting that case studies taking into consideration gender often address additional factors as well).

The colors of the nodes do not convey any specific meaning but serve to visually emphasize the degree (that is, the number of connections) of each of them.

The lines connecting the nodes, called edges, represent the co-occurrence of intersectional axes. The thickness of these lines indicates the strength of co-occurrence, that is, how often case studies mention both social factors together. A thicker line means a higher frequency of co-occurrence.

In sum, graph 5 shows the diverse (independent) intersectional axes distributed across the network, with larger nodes (circles) highlighting more interconnected social factors. A central cluster emerges, consisting of the most frequently used and highly interconnected intersectional axes.

In addition to the social factors per se, we looked at the correlations of each of these intersectional axes (e.g., gender, minority, migrant) with those case studies – the majority – that dealt with CCA in general terms and with those – only six – which addressed specific climate risks (e.g., floods, heat and cold waves). We further took into consideration also whether the case studies were from the Global South, the Global North or covered all countries worldwide as exemplified by the table below (see further details in Annex 2).

Table 1 below shows the six case studies that dealt with a specific climate risk with the indication of which axes they considered and where was the study located.

Title and authors of case study	**Intersectional axes**	**Country** **Cluster: Global North**
"Governing intersectional climate justice: Tactics and lessons from Barcelona" by Ana Terra Amorim-Maia, Isabelle Anguelovski, Eric Chu & James Connolly	gender, migrant, youth, refugee, socio-economic status, elderly	Spain / Catalonia
"Seeking refuge? The potential of urban climate shelters to address intersecting vulnerabilities" by Ana Terra Amorim-Maia, Isabelle Anguelovski, James Connolly & Eric Chu	gender, migrant, youth, disability, health, socio-economic status, minority	Spain/Catalonia
"Discover the dynamics: An intersectional analysis of overt and hidden vulnerabilities to flood risk in urban Denmark" by Anne Bach Nielsen, Sara Bonati, Nina Blom Andersen	elderly, health, disability, gender, minority, digital accesibility	Denmark

"Heatwaves and vulnerable populations: Mapping their needs in The Hague" By Sylvia I. Bergh, Ashley Richard Longman, and Erwin van Tuijl	elderly, health	Netherlands
"Wiener Hitzeaktionsplan- Für ein cooles Wien der Zukunft" (Vienna Heat Action Plan- For a cool Vienna of the future) By City of Vienna	socio-economic status, youth, children, gender, elderly, health, disability, homeless	Vienna, Austria
"Understanding thermal justice and systemic cooling poverty from the margins: intersectional perspectives from Rio de Janeiro" By Antonella Mazzone, Enrica De Cian, Elias de Paula, Andreia Ferreira & Radhika Khosla	gender, minority, socio-economic status, LGTBIQ+, disability, rural/remote areas, elderly, single parent, migrant	Rio de Janeiro, Brazil

Table 1: case studies that identified a specific climate risk per international axes and country.

We can therefore see that gender is the social factor that was mostly considered, followed by socioeconomic status, disability, elderly and health. The latter two factors are those who gained high attention in those case studies under scrutiny in Northern Europe that focused on a specific climate risk. While all the cases took into consideration many intersectional axes, the innovative study on Rio de Janeiro, the only one in the Global South in our sample of cases on a specific climate risk, also included sexual orientation, rurality, and single parenthood – social factors that were ignored by the other case studies. Also, it did not consider elderly. This is in line with the literature that flags how, in comparison to the Global North, elders in the Global South generally suffer less social isolation, which makes them more socially connected and thus more prepared to promptly react vis-à-vis climate specific risks (Beridze et al., 2020).

Finally, out of the 29 case studies that have addressed CCA in general, we noticed that, in the context of global studies, the Global South tends to focus more on specific intersectional axes related to **gender, minority status, and socio-economic status or poverty**, while giving relatively less attention to issues surrounding youth, disability, rural or remote areas, and the elderly. This focus shapes how studies are framed, often prioritizing the challenges of marginalized gender identities, ethnic or cultural minorities, and economically disadvantaged groups.

Global studies typically consider a few intersectional axes, though they often limit themselves to examining just two axes at a time—for example, the interplay between **gender and minority status** or between **gender and socioeconomic status**. Only one case study incorporates a more complex intersectional lens, including a broader range of factors such as **disability, health, socio-economic status, migration status, or refugee experiences**, in addition to gender and minority considerations. These studies demonstrate a deeper exploration of the compounded nature of inequalities vis-à-vis CCA.

When comparing the treatment of intersectionality between cases from the Global South and the Global North, the **11 cases from the Global North generally incorporate a wider variety of axes of consideration** (as detailed in Annex 2). These might include multiple forms of identity or marginalization, allowing for a more multidimensional approach.

In the case studies on the Global South, there is also an increasing focus on **the elderly's knowledge and memory of climate change,** recognizing their lived experiences and traditional knowledge as valuable assets in addressing climate challenges. This reflects a cultural emphasis on intergenerational knowledge and resilience, which is sometimes less prominent in studies focused on the Global North.

Finally, in comparison with those that focused on specific climate risks, among these 29 case studies that tackle CCA in general terms, five – all situated in the Global North – have taken into consideration also **sexual orientation and gender identities (LGBTQIA+)** as a key social factor that intersects with others. This may be due to a simple higher number of case studies as well as to a higher attention in this type of study, but this should be verified with further literature review.

4.3 Paradigmatic case studies

To gain a deeper understanding of the issue, we will now look in more detail at four key case studies from the 35 collected cases—Nepal, Barcelona, Denmark, and Austria. These cases have been selected to show how their advanced intersectional approach enriches and presents new scenarios for a just climate adaptation.

- **NEPAL:** placing marginalized voices at the heart of local climate adaptation in East Nepal

It is commonly accepted that Local Adaptation Plans of Action (LAPA) have emerged as a critical tool to enable communities to simultaneously address their unique needs, development challenges and climate vulnerabilities (Serchan, 2023). It is even further understood in a country as geographically, ecologically and economically diverse as Nepal. In this case, the intersectional approach enables us to recognize a completely feminized and ethnic-diverse society based on an agrarian economy, that leads to the following question: who is on the frontline of climate change effects?

Ilam´s Municipality, in East Nepal, became a pioneer to shaping a Local Adaptation Plan in partnership with the women-led local organization Sahayatra[6], as bearers of traditional knowledge and a meaningful bridge that connects adaptation actions with local demands.

As a result of a participatory process, a first round of capacity building workshops was held to educate local people about climate change, while contemporarily working on community and women's empowerment. By doing so, the diversity of voices was a priority in mapping vulnerabilities, risks and hazards; therefore, a second workshop took place at the community level with a fixed percentage of women, the elderly and ethnic minorities as participants. The needs expressed by the people were translated into strategies and actions, all of which will be monitored and evaluated by both parties, Ilam Municipality and Sahayatra in the next years. A final validation workshop involved the community, local stakeholders and other representatives to present the results, gather final input from all the stakeholders and allocate a specific budget.

The subsequent steps involved mapping, assessing, and incorporating local needs into the planning process by considering intersecting vulnerabilities, as follows.

- Level of education: It is crucial to recognize that climate change is not widely understood or normalized among local communities. To address this, various training sessions and empowerment

6 For more information on the local organization Sahayatra Nepal Ilam, visit their website (https://sahayatranepal.wordpress.com/) or contact them at sahayatranepal.ilam@gmail.com. For more information on their efforts to empower women on climate-related issues, see their work with Prakriti Resources Center at: https://prc.org.np/ and Tewa Nepal: https://tewa.org.np/.

activities have been organized to provide science-based information to challenge misconceptions such as the belief that climate change is a divine punishment.

- Remote and rural areas: Acknowledging the unique challenges of rural areas, those responsible for designing the LAPA visited each community to ensure local representation. For those in more isolated locations, financial support was provided to cover transport costs to secure their inclusion in the process.

- Ethnic minorities: To ensure the inclusion of marginalized ethnic groups, such as the Dalit or Lepcha communities[7], financial support was offered. This approach was crucial given that many members of these communities operate under the premise that "not working today means not eating today," thus emphasizing the importance of financial support to engage them in the process.

- Elderly population: In a cultural context where the elderly hold invaluable knowledge, particularly regarding traditional practices, the LAPA team made special efforts to engage this group by visiting locations where they typically gather, making sure that their opinions were factored into the decisions.

- Gender equality was a fundamental consideration in the LAPA meetings. It was stipulated that meetings would not take place unless women represented at least 30-50% of the participants. Furthermore, these gatherings were designed to be inclusive by allowing children to attend and ensuring that food and rest breaks were incorporated to accommodate women specific needs.

Without the intersectionality lens, it would have been difficult to realize how different intersectional axes such as gender, ethnic minority, age, disability or the condition of living in a rural-remote area, take their own shape and create multiple and diverse scenarios of vulnerability related to climate change.

7 For further information of Dalit women and how they suffer from multiplied discrimination for being both Dalit and female, or they have been unable to obtain basic human rights, go through the article "Empowerment of Marginalized Dalit Women's Groups Through Microfinance and Social Capital in Nepal" from the authors (Aoki and Pradhan 2022). For the Lepcha cast, read "Empowerment and Status of Women in Lepcha Tribal Community: A Household Level Analysis" from (Lepcha, K., & Chhetri, B. 2017).

Picture 1: Group of Lepcha women discussing on climate adaptative solutions for local crops[8].

8 Photo by Adriana Recalde Martínez, 2024, Ilam, East Nepal.

- **DENMARK**: an intersectional lens to uncover the hidden vulnerabilities of affluent societies

While there is a tendency to focus on low resources, disadvantaged and marginalized urban communities, less is known about how vulnerability manifests in digitalized, affluent, privileged urban societies such as the city of Frederiksberg, an inner zone within Copenhagen's municipality. Here, an intersectional approach identifies and brings to the table the voices of those who suffer from a high exposure to flooding, moving towards a new way of understanding climate vulnerabilities.

As a result of 22 expert interviews with local stakeholders and a total of six focus groups representing the very diverse backgrounds and contextual differences of Frederiksberg, the case study proposes a Dynamic Vulnerability Assessment based on the demands and needs of the local population. It is designed to look at hidden vulnerabilities from four different dimensions.

- Physical/sensorial vulnerability: In this context, physical ageing and disabilities emerged as significant individual markers of vulnerability. Interestingly, many older adults did not perceive themselves as vulnerable unless they faced mobility challenges. On the contrary, they often described themselves as resourceful and resilient, drawing on their prior experiences with flooding events.

- Material/infrastructural vulnerability: Similarly, factors such as geographical location (e.g., residing in low-lying areas), housing type (ground floor versus upper floors), and access to digital information significantly influenced vulnerability. Notably, individuals living in seemingly safe areas were still at risk if they lacked access to digital connectivity, highlighting the intersection of infrastructure and technology in shaping risks.

- Social/cultural vulnerability: Older adults' limited digital literacy often left them disadvantaged in situations requiring communication and connectivity during flood emergencies. Moreover, for those experiencing social isolation, the absence of robust social networks further amplified their vulnerability, demonstrating the critical role of community ties in resilience.

- Relief/organizational vulnerability: This dimension highlights the systemic capacity—or lack thereof—to inclusively represent and engage all community members in decision-making processes. The exclusion of diverse voices, particularly in discussions on flood risk adaptation, not only undermines equity but also intensifies vulnerabilities by neglecting the needs of marginalized groups.

To address the challenges faced by vulnerable citizens during flooding events, the following actions were proposed; first, it is essential to adapt disaster communication systems to accommodate digital and physical disabilities by diversifying information channels and ensuring accessibility through inclusive audio, visual and multilingual options. Strengthening neighborhood ties is also imperative to combat social isolation, with initiatives such as pairing younger households with older individuals to provide support during emergencies. Finally, leveraging local knowledge is critical, as residents' first-hand experience of flooding and familiarity with environmental clues, such as the color of the water or the speed of the current, can greatly enhance climate adaptation efforts.

The findings underscore how vulnerability is shaped by the intersection of living in poorly adapted flood-prone regions, inadequate infrastructure, and the challenges of weak social ties or insufficient digital and physical skills. At the same time, relying solely on fixed vulnerability markers may fail to capture risks, particularly for overlooked groups like isolated elderly residents in affluent neighborhoods who face significant barriers to adaptation.

Picture 2: Person walking under the rain in Denmark[9].

- **BARCELONA**: the reflection of building a strong social fabric amongst neighbors

Barcelona is paving the way for the creation of adaptive urban infrastructure to equitably support “most vulnerable citizens” who are disproportionately affected by extreme weather temperatures. As climate shelters emerge in many corners of the city, this study raises the following question: To what extent do these emerging spaces address the intersecting vulnerabilities and lived experiences of marginalized populations?

This must serve as a critical reminder: adaptation strategies that fail to address the intersecting vulnerabilities and diverse capacities of marginalized communities may inadvertently reinforce systemic marginalization rather than delivering the adaptive outcomes they aim for. This discussion underscored how climate shelters both reflect and contribute to the urban fabric, while also being deeply rooted in historical systems of power, control, and inequitable access (e.g., segregation, racial zoning, and gendered labor roles).

Aiming to reverse the imbalance, the focus was placed on La Prosperitat, a particularly climate-vulnerable working-class neighborhood. Through an intersectional lens, the study carefully captured self-reported experiences of extreme heat and cold, awareness and use of the Climate Shelter network, experiences of discrimination based on gender/sex, country of origin or previous habitual residence, age, race/ethnicity/color, religion or sexuality, concerns about climate change, and their ideal Climate Shelter features.

9 Photo by Efrem Efre, 2023, Pexels, free to use: https://www.pexels.com/photo/person-walking-with-umbrella-on-city-street-14987845.

Methods such as women's focus groups, the use of citizen science principles, a feminist perspective, grassroots surveys based on neighborhood's diversity, activities in senior social centers or organized events and interviews to collect oral histories and lived experiences, were key to capturing the unique and intersecting vulnerabilities of residents and their demands for adaptation.

The findings revealed that women, the elderly, residents migrating from the Global South, and low-income communities ranked prominently on vulnerability indicators.

- With a focus on women, research shows that risk of death due to extreme (hot) temperatures is higher among them. Nevertheless, they are more likely to stay at home in comparison to men. Intersecting with that, women are especially impacted by rising costs of living, creating specific energy-poverty scenarios.

- Similarly, many elderly people prefer to remain at home during extreme temperature events, which, combined with potential mobility challenges, limit their ability to seek relief or assistance, further creating unique vulnerability scenarios.

- Migrants, predominantly from the Global South, often endure harsher living conditions due to inadequate home insulation, lack of cooling or heating systems, and energy poverty. Despite being disproportionately affected by extreme weather events, they remain largely uninformed about the Climate Shelter initiative, largely due to inadequate outreach and promotion. This lack of information is compounded by a prevailing sense of exclusion and unwelcome, which further discourages them from accessing these essential spaces.

- Socio-economic status also plays an important role in determining vulnerability to extreme temperatures. Low-income residents are disproportionately affected due to inadequate housing infrastructures and energy poverty, but it was reported that they suffered from limited access to refuge facilities.

These first-hand experiences were transformed into primary data, that later shaped their ideal Climate Shelter, based on the needs and envisioned characteristics of their neighbors. The community focused on creating a protected space from extreme temperatures while addressing overlapping socio-environmental needs, such as increased access to nature (e.g., vegetation or water resources) or the development of recreational and cultural activities. In conclusion, the mere presence of such spaces is insufficient to meet the needs of people with entrenched, intersecting vulnerabilities. Definitively, these groups require tailored, consistent and culturally relevant outreach to ensure they can fully benefit from adaptation initiatives. And of course, the very first step is to engage them in the process.

Picture 3: The city of Barcelona[10].

- **VIENNA**: the heat as a revelation of what is wrong with our society

In these times, public consciousness is focused on extreme weather events such as storms, torrential rains and the floods they cause. Less attention has been paid to massive heat stress, which now causes more deaths than road traffic (City of Vienna, 2024). As a result, the increase in urban heat due to climate change and its health risks is a growing concern in Vienna.

In this context, the adoption of an innovative Heat Action Plan entitled “For a Cool Vienna” should be celebrated as a triumph, also for promoting an intersectional approach, since it recognizes that the impact of heat is not uniform across social groups and thus includes prioritized, targeted measures based on levels of vulnerability. It also notes that heat is particularly dangerous for people in poor health and other high-risk groups including socially isolated people or those living and/or working under particularly difficult conditions, largely because of their inability to adapt quickly to heat waves. It is therefore imperative to create conditions to maintain their quality of life.

Among its key features, it stresses the need for effective implementation and therefore clearly defines and identifies the responsible body and all relevant institutions, authorities and organizations involved in each targeted action. Rather than being a static document, Vienna plan’s flexibility supports ongoing monitoring and evaluation in light of the rapidly changing climate conditions. However, it is its recognition of a multitude of intersecting axes, with almost half of the targets - 13 out of 29 - specifically tailored to vulnerable groups, that makes it particularly valuable.

10 Photo by Pixabay, 2016, Pexels, free to use CC0: https://www.pexels.com/photo/brown-white-and-gray-city-buildings-during-daytime-48893.

With the elderly comprising around 10% of the population, it is well-known that their ability to regulate heat is low, making them more susceptible to dehydration and heat-related risks. Similarly, women are more likely to feel faint than men because they sweat less, which reduces the effectiveness of their cooling mechanisms. This vulnerability is even more pronounced in pregnant women, who are less heat tolerant and therefore more susceptible to heat stress. The inability to effectively respond to heat is also evident among socially isolated individuals, those requiring care, the homeless, and young children. In this context, an innovative view on vulnerabilities highlights the challenges faced by people with chronic or mental health conditions, where depression, for example, is closely linked to a decline in self-care and a failure to adopt heat stress prevention strategies. Factors like inadequate housing, educational disparities, and language barriers intersect with various axes, giving rise to unique vulnerability scenarios. Finally, outdoor workers in sectors like construction or agriculture are identified as a particularly vulnerable group, as high temperatures reduce productivity and significantly raise the risk of accidents.

Among the measures implemented, we underline the following:

- A list of elderly and socially isolated people distributed to medical services and doctors, so that they can contact them during heatwaves, monitor their condition, and if necessary, prescribe medication through pharmacy delivery services, telephone consultations, or home visits.

- Launching a heat-line for at-risk communities, enabling direct communication via calls or SMS for heat-related advice, along with close coordination with a team of nurses and paramedics for follow-up home visits.

- Establishing robust neighborhood support networks through various workshops. While this measure has proven to be highly effective, close neighborly relations based on mutual aid have become increasingly rare in modern residential buildings.

- As part of making cooling zones accessible for all, the proposal includes providing shuttle transportation for vulnerable groups to cool areas and offering discounted or free bus Wiener Linien tickets for those seeking to access these spaces.

- Providing cooling facilities, including showers, and measures to cool day-care centers for homeless people.

- Conduct school workshops to educate parents, especially those from low socio-economic backgrounds, about the dangers of heat and provide them with tools to combat it.

- The Heat Toolbox: A practical guide featuring advice for coping with heat at home and work, health tips, ‘cool tours’ to refreshing locations, maps of cooler spots in the city, and a summer recipe book.

Reflecting the fluid nature of intersectionality -shaped by personal, environmental, and social conditions- this living document seeks to prioritize high-risk groups exposed to heat while emphasizing Vienna's responsibility to maintain the well-being of its diverse population.

Picture 4: Homeless in Vienna[11].

11 Photo by Stephan Scharf, 2021, Flickr: https://www.flickr.com/photos/152025102@N05/50860098437.

5 Lessons learnt and applicability to South Tyrol

In this section, we summarize eight lessons derived from all the analyzed case studies (see also graph 6 below).

1. Climate policies through feminist and intersectional lenses

First and foremost, the findings emphasize the critical need for both pre- and post-assessment of climate policies through feminist and intersectional lenses. This approach ensures that climate policies and programs are gender-inclusive and equitable, addressing the diverse and intersecting needs of women and other gender identities as well as other marginalized groups too.

Incorporating a gender perspective is essential for addressing systemic inequities, while also highlighting the importance of integrating an intersectional approach into climate-related policy recommendations. This ensures that governments and international organizations uphold basic standards for all populations, paying special attention to those most vulnerable to social and environmental injustices.

An intersectional feminist analysis helps uncovering structural inequalities and informs the development of strategies for bridging movements that engage in intersectional politicization. This process strengthens collective advocacy and fosters collaboration across sectors.

2. (All) age(s)-inclusive approach to climate policymaking

Second, regarding age, it is essential to foster meaningful discussions about the importance of integrating young people directly into decision-making processes. This approach moves beyond merely involving them in superficial roles or using them as symbolic participants in environmental campaigns. True inclusion ensures that youth perspectives, shaped by their diverse backgrounds and lived experiences, are actively considered and valued in shaping policies and programs.

At the same time, it is crucial to acknowledge and address the stratification of seniors' experiences. Older generations possess varied perspectives based on their unique socio-economic, cultural, and historical contexts. Including these insights alongside youth participation creates a more comprehensive and age-inclusive approach to climate policymaking, ensuring that decisions reflect the needs and contributions of all age groups.

3. Integrate migrants and recent residents' perspectives in climate policies

Third, the perspectives of migrants and recent residents are critical to shaping inclusive and effective climate policies. These perspectives can spark important discussions on how, for example, the healthcare system or the housing system can adapt and equip itself to ensure equal access to all vis-à-vis climate specific risks. This is particularly relevant given that South Tyrol is an increasingly ethnically diverse province with a significant portion of their populations born outside it.

To address these challenges, assessment tools can be employed to evaluate, update, and integrate existing and future climate policies, ensuring they are more inclusive and responsive to the needs of diverse communities. These tools help identify gaps in service provision and guide the development of equitable solutions.

Additionally, considering the vulnerabilities associated with modern urban societies underscores the importance of tailored approaches. Including migrants and recent residents can create more resilient

systems that cater to the unique challenges faced by migrant populations, ensuring no group is left behind.

4. Beyond victimhood but focus on agency in climate planning

This leads to our fourth point: a key lesson learned is the importance of not approaching vulnerable groups solely from a "victim" perspective. Instead, these groups should be recognized as active agents capable of contributing meaningfully to decision-making processes, particularly in the context of climate change mitigation and adaptation strategies. Empowering them to participate actively ensures their voices are heard and their unique perspectives are integrated into policies and programs.

It is essential to move beyond the narrative of victimhood and instead adopt identity and recognition policies that acknowledge the strengths, capacities, and contributions of these groups. Such policies aim to rebalance power dynamics within society, fostering greater equity and inclusion. By addressing systemic imbalances and recognizing the agency of vulnerable populations, these approaches create a more participatory and just framework for tackling climate challenges collectively.

5. Participatory methods for shaping climate instruments and policies

This connects to our fifth point: the importance of considering and actively involving all sectors of society in the creation of climate change instruments and policies. This entails designing participatory processes where representatives from gender offices, as well as advocates and representatives from vulnerable groups, are meaningfully included to ensure their perspectives are integrated into decision-making.

For instance, focus group discussions can be employed to explore how different groups perceive climate change and the adaptation strategies they prioritize. These discussions provide valuable insights into the specific concerns, needs, and preferences of various communities, particularly those that are often underrepresented.

Additionally, participatory methods such as citizen assemblies, community consultations, or stakeholder mapping – some of which already in place in South Tyrol – can be used to include minorities or marginalized voices (women, other gender identities, youth, elderly, migrants or recent residents, etc.), throughout the policy design, creation, and implementation stages. These methods not only amplify diverse perspectives but also foster a sense of ownership and accountability among all societal members.

By prioritizing inclusivity, these approaches ensure that climate policies are not only equitable but also more effective in addressing the diverse challenges posed by climate change.

6. Mapping (real or potential) areas of conflict

Sixth, we found how the Global Environmental Justice Atlas (EJAtlas) informed us about the importance of mapping (real or potential) areas of conflict. By doing this, we can better understand potential underlying conflicts, such as those related to land use, resource distribution, migration patterns, and access to essential services like water and food. It also helps to identify or at least shed light on how marginalized communities are disproportionately affected by both the physical effects of climate change and the policies aimed at mitigating or adapting to those effects.

7. Rural areas cannot be left behind

Seventh, case studies also indicated that rural areas cannot be left behind in the context of climate change because they are often disproportionately affected by its impacts and are essential to the broader strategies for climate mitigation and adaptation. These areas typically rely more heavily on natural resources like agriculture, water, and forests, which are highly vulnerable to climate change. For example, shifting weather patterns, increased frequency of droughts, floods, and storms, as well as changing crop cycles, can severely disrupt the livelihoods of rural populations who depend on farming and other resource-based activities for survival.

Furthermore, ignoring rural areas in climate change strategies risks exacerbating the inequalities between urban and rural populations, potentially leading to greater displacement, poverty, and social unrest. Given that rural areas are foundational to food production, biodiversity conservation, and land-based carbon sequestration, ensuring their inclusion in climate change policies is crucial for achieving broader sustainability and justice goals. Only by integrating rural communities can we ensure that climate policies are equitable, comprehensive, and effective.

8. Learning from other cities: climate shelters, public awareness campaigns, homeless targeted support, integration of health and social services, and consider vulnerability in all landscapes

Lastly, we highlight some lessons learnt from the abovementioned paradigmatic case studies, that are Barcelona, Vienna and Frederiksberg.

Although two of them are capital cities not comparable to Bolzano, they are worth a comparison since they have put in place strategies and policies from which South Tyrol can learn too.

Form the studies and the policies on and of Barcelona, they have not only considered how specific climate risks, e.g., heat waves, differently affect the population along gender, age and socioeconomic status, but they have also generated information about which citizens are more affected by climate change before planning or creating policies. Also, they have included mental health reflections. They have also promoted climate shelters with consideration of which identities, cultural values and perspectives in the designing process and have included the diversity of points of view to combat thermal (dis)comfort.

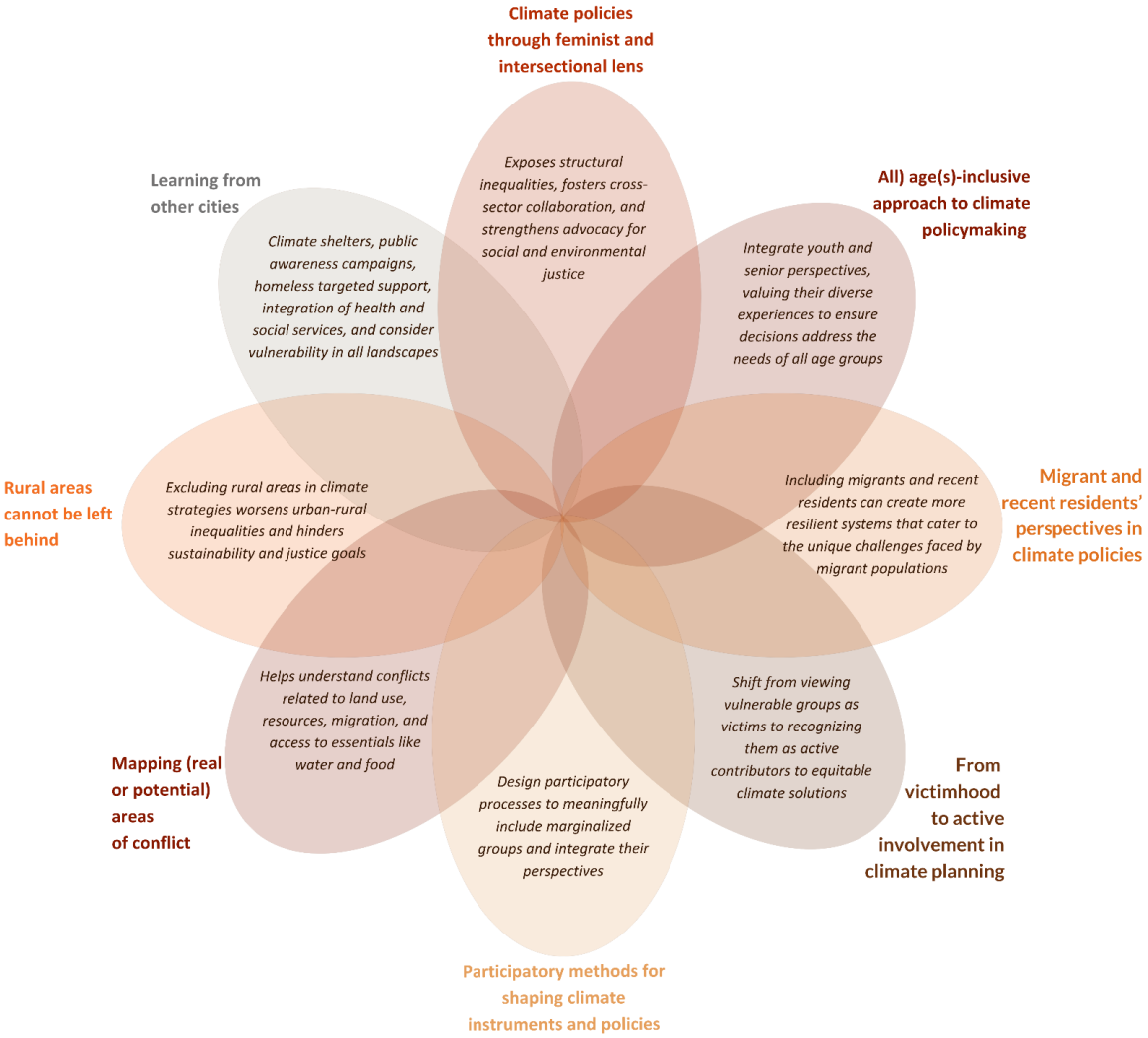
Vienna’s focus on addressing intersectional vulnerabilities—where a combination of social, health, and economic factors heightens risks—offers valuable lessons for South Tyrol, particularly for the city of Bolzano. This approach involves implementing measures such as tailored communication strategies for at-risk groups (e.g., the elderly, people with chronic conditions, and those who are socially isolated) and climate justice initiatives.

For example, public awareness campaigns in Vienna include educating the public through workshops, online resources, and localized heat alerts. Targeted support for homeless populations involves specific actions to safeguard homeless individuals from heat stress, such as providing hydration stations, shaded areas, and access to cooling shelters. Additionally, the integration of health and social services in Vienna demonstrates the importance of close collaboration between health and social service sectors to address heat-related health risks—an approach that could be effectively adapted for Bolzano and beyond.

Finally, we have learned from Frederiksberg how a small city does address the challenge of floods. As the authors of this study said, this serves as a 'critical case'—a case of strategic significance that offers valuable insights into broader climate change issues. The logic behind this choice is straightforward: if a city like Frederiksberg, with its resources and infrastructure, faces significant vulnerabilities to flooding

due to climate change, then similar vulnerabilities are likely present in other prosperous regions or areas, such as South Tyrol as well.

By examining how Frederiksberg handles its flood risks, we can glean important lessons about the challenges that even wealthy municipalities face in adapting to climate change. These insights can then be applied to other regions with comparable socio-economic contexts, ensuring that climate resilience strategies are inclusive and effective across a range of urban environments. This approach underscores the need to consider vulnerability in all landscapes, not just those that are traditionally viewed as disadvantaged, and highlights the importance of equitable climate adaptation measures.



Graph 6: Graphic summary of the eight key lesson learnt form case studies

6 Concluding remarks

This report has gathered, analyzed, and discussed examples of how states, regions, cities, or other communities (beyond South Tyrol) have approached the integration of perspectives related to gender, minorities, youth, migrants—or a combination thereof— as well as other social factors into their adaptation policies. It also assessed the application of an intersectional lens in these efforts, examining both successes and challenges. The goal was to derive lessons from these cases to promote cross-fertilization and inspire strategies for South Tyrol. While the latter are discussed above in section 5, here we wanted to underline once again the critical role of intersectionality in climate adaptation as well as to point at the existing research gaps, needs and the foci for future research.

In this report, we have seen and argued that intersectionality functions as a dual tool: a theoretical lens and a practical method for confronting intersecting vulnerabilities and envisioning more inclusive and equitable climate policies. While 16 case studies are grounded in theory, 19 combine both theoretical and practical elements. However, we must acknowledge the concerns raised in recent IPCC reports, which highlight that, despite strong confidence in the growing importance of intersectionality for equitable environmental policies, there is limited evidence of its explicit inclusion in adaptation plans and measures (IPCC, 2022). This must serve as a wake-up call for scholars and policymakers to deepen the exploration of the practical benefits of applying an intersectional lens and to translate this concept into tangible actions at institutional levels and across all geographic scales.

There is an emerging language of intersectionality among certain political forces. However, the positive expressions of political will often get lost in a fog of noncommittal phrases. A key challenge is that more established institutional and political structures often lack the capacity, resources and commitment needed to effectively navigate the complexities of intersectional analysis. As in the case of gender experts, also intersectionality experts could become part of or commissioned by governing institutions and other non-governmental bodies. As stated in section 2, the Horizon Europe program aims to use an intersectional approach to better understand societal challenges, both in project design and funded research activities.

Within this framework, a core finding of our research on integrating intersectional perspectives is that vulnerability is not inherently tied to single, fixed characteristics such as being a woman, having a disability or experiencing social isolation. Under the intersectionality approach, individuals cannot be reduced to static social groups, as this perspective fails to capture the internal complexities and context-dependent disparities within those groups. Instead, vulnerability is shaped by the dynamic and contextual interplay of personal, environmental and social factors. Understanding intersections as living and changing realities is therefore key to protecting the people behind them. A closer examination of the analyzed case studies using an intersectional lens revealed, for example, how gender and caste intersect to shape vulnerability in climate adaptation efforts in Nepal. Conversely, in Europe, challenges like social isolation or digital disability often leave older adults struggling the most to adapt to changing climate conditions. These examples suggest that a dynamic and contextual interplay approach to intersectionality is being advanced, albeit slowly.

When it comes to methods, our research highlights significant synergies between the intersectional approach and qualitative methodology applied to climate change adaptation cases. The lived experiences of individuals become the primary sources of data, and consequently feminist approaches and methods such as focus groups, citizen science principles, grassroots surveys, activities in senior social centers or the use of storytelling and oral history are remarkably effective in capturing the complexity of social dynamics that intertwin with the challenges of climate adaptation. Such methods are also proving invaluable in preserving the knowledge of indigenous communities and elders regarding climate change adaptation.

Building on these methods, there is also a clear need for the development and dissemination of practical tools that can help policymakers and practitioners effectively implement an intersectional approach. These tools could include frameworks for assessing the differentiated impacts of climate change on various social groups, guidelines for engaging marginalized communities in decision-making processes, and metrics to evaluate the inclusivity and equity of adaptation initiatives. Furthermore, ensuring the successful implementation of intersectional approaches requires the allocation of adequate resources, both financial and human. Institutional support must be backed by targeted funding, capacity-building initiatives, and cross-sectoral collaborations to foster systemic change.

In addition, we stress that merely implementing climate adaptation measures is insufficient to meet the needs of those facing deep-seated and interconnected vulnerabilities. As our case studies' analysis demonstrates, effective support for these groups requires targeted, continuous, and culturally appropriate outreach to ensure their full engagement with and benefit from adaptation programs.

In this sense, by challenging the notion that the most vulnerable are often the most silent, the starting point of knowledge production must be rethought and repositioned. In line with Harding's standpoint theory (Harding, 1991), we agree that the multiple views and acknowledgements of underrepresented groups are not only crucial but also the most probably truthful in the development of climate adaptation measures. Furthermore, the way in which the everyday experiences and multiple vulnerabilities of these underrepresented groups are reached and captured must by necessity be done through an intersectional lens.

Finally, the importance of strengthening neighborhoods and civic networks in today's society cannot be overstated. Modern housing often encourages isolation, wherein close neighborhood relationships and mutual assistance become a rarity. In many cases, we only become aware of a neighbor's need for help when it is too late, such as when someone dies without anyone noticing. These lapses in community care highlight a critical flaw in our social fabric. In the City of Vienna's case study (section 4.3), the heat, whether literal or metaphorical, brings these issues to the surface, exposing the growing disconnection and individualism that inhibits community support. Strengthening neighborhood and civic networks is essential, not only to ensure that people's needs are addressed before it's too late, but also to cultivate a sense of shared responsibility and care that can improve everyone's well-being in a changing climate. This has been proved by the recent Valencia's storm and flooding tragedy: leaving aside the atrocious lack of information and communication, we have seen how social isolation may hinder peoples' capacity to react promptly to sudden events as well as how human solidarity after the disaster plays a crucial role (see section 4.3).

As part of our exploration into cities making progress in climate resilience commitments, the case of the City of Vienna (section 3.4) serves as a promising example of how institutional engagement can lead to meaningful integration of intersectionality in climate adaptation strategies. Drawing from such experiences, future research could focus on identifying transferable lessons, best practices, and innovative approaches from cities, regions, and communities worldwide. A particular emphasis should be placed on learning from the lived experiences and knowledge systems of marginalized sectors of society, including women, youth, minorities, migrants, and others.

Among the foci for future research we see the need for further study, design and development of methodologies, decision-support tools, and participatory frameworks that facilitate the application of intersectionality in adaptation planning and implementation; explore strategies for embedding intersectionality in institutional structures; investigate further how to effectively engage marginalized communities in co-creating adaptation policies, ensuring their voices are central to decision-making processes; and design and test metrics for assessing the equity and inclusivity of adaptation initiatives, ensuring accountability and continuous improvement.

By addressing these research areas, the field can move closer to operationalizing intersectionality in climate justice and adaptation, crafting frameworks that are not only theoretically robust but also practically effective in tackling the diverse and pressing needs of communities across the globe.

Annex 1: Glossary

Age: a biological measure representing the span of years between birth and death. Though it has an objective aspect, reflecting the number of years a person has lived, it also carries subjective and socially constructed elements, such as ageism—prejudice based on age—which can apply to any age group (Nelson, 2016).

Digital accessibility: a challenge mostly percieved in developed societies in which social media, e-mails and other digital communications solutions are increasingly used by public sector actors or NGOs (e.g. disaster risk communication), creating a digital divide, overall, in the elderly. These challenges stem from factors like limited digital skills, physical impairments (e.g., vision loss or arthritis), cognitive decline, lack of access to devices or the internet, and negative attitudes toward technology. It highlights their vulnerability to digital exclusion and underscores the need for accessible design and tailored digital education (Christopher Newell, 2003; Lai et al., 2018).

Disability: A mental or physical condition that limits an individual's ability to perform one or more major life activities, such as seeing, hearing, speaking, walking, communicating, sensing, breathing, performing tasks, learning, working, or self-care (ADL 2022).

Gender is understood in this report as a fluid and diverse concept aligned with the idea of gender pluralism—existing on a continuum rather than within binary boundaries. Specifically, we view gender as a social (and legal) construct, recognizing that the categories it defines (e.g., "women" or the label "LGBTIAQ+") are not only imposed or utilized by policymakers and legal professionals but are also embraced by the same groups advocating for their rights, such as feminist and/or LGBTIAQ+ civil society organizations (Richardson, 2020). Having said this, we are aware that the majority of research analyzed in this report refer mainly to women than to other gender identities. This was not a deliberative choice but due to the scarcity of research on climate justice and other gender identities.

Health: "A state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity" (WHO-World Health Organization, 2020).

Homelessness: it refers to the condition of an individual or family lacking a permanent address or residence, with no immediate prospects, resources, or ability to secure one. It generally encompasses individuals staying in unsheltered areas, shelters, or temporary accommodations due to the inability to obtain permanent housing. Those experiencing homelessness often move between different locations, as many individuals who sleep outdoors may eventually access shelter services (Homelessness Learning Hub 2024).

Level of education: an organized set of categories designed to classify educational programs based on levels of learning experiences and the knowledge, skills, and competencies and the progression of complexity and specialization in educational content, ranging from basic to advanced (UNESCO, n.d.).

LGBTIAQ+: generic term usually denoting, but not limited to, the sexual orientations and gender identities of lesbian (L), gay (G), bisexual (B), transgender (T), intersex (I) asexual, aromantic and agender (A), and queer (Q) (any other gender identity or sexual orientation falls under '+'). (IOM LGBTIQ+ Focal Point 2020).

Migrants: in this report we align to the EC definition of "with a migratory background" as: "A person who has: (a) migrated into their present country of residence; and/or (b) previously had a different nationality from their present country of residence; and/or (c) at least one of their parents previously entered their present country of residence as a migrant"(European Commission 2010).

Minority is conceptualized along “ethnicity”, encompassing self-identification linked to linguistic communities or territories, perceived ancestry, religion, or other subjectively influential factors. It may also involve a disproportionate association with specific socioeconomic traits, lifestyles, strategic group mobilizations, and cultural distinctiveness, such as unique norms and practices (Meer, 2014).

Refugee status: the status of being a refugee, that is, a person who, due to a justified fear of persecution based on race, religion, nationality, political beliefs, or membership in a specific social group, is outside their home country and cannot or will not seek its protection; or a stateless individual who, for the same reasons, is outside their former habitual residence and cannot or will not return (European Commission, n.d.).

Rural/remote areas (including, social isolation): people living in geographically or socially isolated areas, with limited positive social contacts and feelings of loneliness, face heightened risks of exclusion from climate adaptation efforts and disaster communication. Their isolation often results in reduced social control, limited support networks, and a lack of accessible contacts during emergencies, increasing their vulnerability to climate impacts (City of Vienna 2024).

Single parent: Single-parent families consist of a parent or caregiver and one or more dependent children, without a spouse or adult partner to share parenting responsibilities (Lindwall et al., 2011).

Socioeconomic status: “is the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation” (European Commission, 2021b).

Annex 2: List of case studies

Case title	Authors	Year	Country	Link/DOI
Die Österreichische Strategie zur Anpassung an den Klimawandel	Publisher and editor: Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, Radetzkystraße 2, 1030 Vienna; Authors: Maria Balas et al.	2024	Austria	https://www.bmk.gv.at/en/topics/climate-environment/climate-protection/austrian-strategy-adaptaion.html
Governing intersectional climate justice: Tactics and lessons from Barcelona	Ana Terra Amorim-Maia, Isabelle Anguelovski, Eric Chu & James Connolly	Study published in 2023. It considers policies adopted during 2015-2023	Spain / Catalonia	www.doi.org/10.1002/eet.2075
Justicia climática interseccional y políticas públicas de Barcelona	Marina Garcia Castillo & Gloria García-Romeral	Study published in Jan 2023. It considers policies adopted since 2009.	Spain / Catalonia	https://www.idhc.org/es/publicaciones/justicia-climatica-interseccional-y-politicas-publicas-de-barcelona.php
Seeking refuge? The potential of urban climate shelters to address intersecting vulnerabilities	Ana Terra Amorim-Maia, Isabelle Anguelovski, James Connolly & Eric Chu	Study published in 2023 with data collection from 2022.	Spain / Catalonia	https://doi.org/10.1016/j.landurbplan.2023.104836
Gender equality and climate change in plural legal contexts: A critical analysis of Kenya's law and policy framework	Patricia Kameri-Mbote and Nkatha Kabira	2023	Kenya	https://doi.org/10.4337/9781803923796.00012

Discover the dynamics: An intersectional analysis of overt and hidden vulnerabilities to flood risk in urban Denmark	Anne Bach Nielsen, Sara Bonati, Nina Blom Andersen	2021-2022	Denmark	https://doi.org/10.1016/j.landurbplan.2023.104799
Envisioning healthy futures: Youth perceptions of justice-oriented environments and communities in Northern British Columbia Canada	Onyx Vanessa Sloan Morgan, Kimberley Thomas, Laura Mcnab-Coombs	2022	Canada	https://doi.org/10.1016/j.healthplace.2022.102817
Intersectional climate urbanism: Towards the inclusion of marginalised voices	Rachel McArdle	2021	International (+Ireland)	https://doi.org/10.1016/j.geoforum.2021.08.005
A Right to Adaptation: Securing the Participation of Marginalised Groups	Emily Polack	2008	Global study	https://doi.org/10.1111/j.1759-5436.2008.tb00472.x
The gender equality and environment intersection. An overview of development co-operation frameworks and financing	OECD (Juan Casado-Asensio, Cibele Cesca, Charlotte Goemans and Laura McDonald)	2023	DAC members	https://www.oecd-ilibrary.org/development/the-gender-equality-and-environment-intersection_c16d8fe8-en
Bringing migrants' perspectives in 'migration as an adaptation strategy' discourses	Lore Van Praag	2023	Global study	https://doi.org/10.1111/geoj.12530
Turning up the heat: A conceptual model for understanding the migration and health in the	Aqsa Khalid, Jabran Ali Babry, Jo Vearey, Dominik Zenner	2023	Global study	https://doi.org/10.1016/j.jmh.2023.100172

context of global climate change				
Youth and climate justice: Representations of young people in action for sustainable futures	Onyx Sloan Morgan, Fabiola Melchior, Kimberley Thomas, Laura McNab-Coombs	2023	Global study	https://doi.org/10.1111/geoj.12547
Intersectional climate justice: A conceptual pathway for bridging adaptation planning, transformative action, and social equity	Ana T. Amorim-Maia, Isabelle Anguelovski, Eric Chu e, James Connolly	2022	Spain / Catalonia	https://www.sciencedirect.com/science/article/pii/S2212095521002832?via%3Dihub
Socially just adaptation to climate change	Jean Welstead et al.	2012	UK	https://www.climatejust.org.uk/resources/socially-just-adaptation-climate-change
Progress, good practices and lessons learned in prioritizing and incorporating gender-responsive adaptation action.	UNFCCC	2023	Global study	https://unfccc.int/sites/default/files/resource/202310_adaptation_gender.pdf
A gender and intersectionality responsive climate adaptation plan for London	Zack Polanski and researchers from UCL	2023	UK	A gender and intersectionality responsive climate adaptation plan for London | London City Hall
The diversity of gendered adaptation strategies to climate change of Indian farmers: A feminist intersectional approach	Federica Ravera, Berta Martín-López, Unai Pascual, Adam Drucker	2016	India	https://link.springer.com/article/10.1007/s13280-016-0833-2
Gender-Ethnicity Intersectionality in Climate Change Adaptation in the Coastal Areas of Bangladesh	Assaduzzaman, M; Filatova, T. Lovett J. Coenen Frans	2023	Bangladesh	https://www.mdpi.com/2071-1050/15/4/3744

Effects of Climate Mobility on Women and Girls in the MENA Region	IOM UN MIgration	2024	MENA region	https://mena.iom.int/sites/g/files/tmzbdl686/files/documents/2024-01/climate-mobility-women-girls-mena.pdf
Implementation of Gender-responsive climate action in the context of sustainable development	UNFCCC	2015	UN	https://unfccc.int/files/gender_and_climate_change/application/pdf/egmreport.pdf
Global Environmental Justice Atlas (EJAtlas)	Joan Martinez-Alier, Daniela Del Bene, Mariana Walter, Eleonora Fanari, Grettel Navas, Marcel Llavero-Pasquina, Arnim Scheidel, Layla van der Donk, Sarah Eckstein and Ksenija Hanaček	ongoing	Global study	https://ejatlas.org/ https://journals.librarypublishing.arizona.edu/jpe/article/id/1932/
Summer School on Degrowth and Environmental Justice	REsearch and Degrowth / ICTA- UAB	2024	Spain/ Catalonia	https://summerschool.degrowth.org/
A Critical Feminist Evaluation of Climate Adaptation Law and Policy: The Case of Aotearoa New Zealand	Elizabeth Macpherson, Annick Masselot, David Jefferson, Julia Gunn	2024	New Zealand	https://doi.org/10.1163/18786561-bja10050
Gender equality and climate justice programming for youth in low- and middle-income countries: an analysis of gaps and opportunities. Environmental Education Research	Christina T. Kwauk and Natalie Wyss	2023	Low and middle-income countries	https://doi.org/10.1080/13504622.2022.2123894
Intersectional politicization: A facet of youth activists' sociopolitical development	Jerusha O. Conner, Johnnie Lotesta and Rachel Stannard	2022	United States	https://doi.org/10.1002/jcop.22941

A Toolkit integrating Migration into Environment and Climate Change Interventions	Katy Barwise, Alison Talkers, and Elizabeth Linklater (IOM)	2021	N/A	https://environmentalmigration.iom.int/sites/g/files/tmzbdl1411/files/documents/environment-climate-change-toolkit.pdf
Climate change adaptation and protection from natural hazards: capacity building for people with migration background in Austria	Weber, K., Stickler, T., Wernhart, S., Fuchs, B., Dopler, A., Kaunert, M., Glas, N., Machold, I., Dax, T., Kuntner, K., Bigler, M., Nigmann, T., Hübl, J., Balas, M., Damyanovic, D. (2019): Climate change adaptation and protection from natural hazards: capacity building for people with migration background in Austria. Endbericht ACRP Forschungsprojekte B567036.	2019	Austria	https://www.klimafonds.gv.at/wp-content/uploads/sites/16/B567036-ACRP8-CCCapMig-KR15AC8K12516-EB.pdf
Heatwaves and vulnerable populations: Mapping their needs in The Hague Final report, February 2022	Sylvia I. Bergh Ashley Richard Longman Erwin van Tuijl	2022	Netherlands	https://pure.eur.nl/ws/portalfiles/portal/79274217/Heatwaves_and_vulnerable_populations_report_final.pdf
Canada's Partnership with Indigenous Peoples on Climate	Government of Canada	since 2022 (ongoing)	Canada	https://www.canada.ca/en/environment-climate-change/services/climate-change/indigenous-partnership.html
Wiener Hitzeaktionsplan- Für ein cooles Wien der Zukunft	City of Vienna	2024	Vienna, Austria	https://www.wien.gv.at/spezial/hitzeaktionsplan/files/hitzeaktionsplan-2024.pdf
Declaración "Activas por el Clima" del Encuentro Mujeres y Cambio Climático	Red de Mujeres Activas por el Clima o emakumeoklima	since 2018 (ongoing)	Navarra, Spain	https://www.navarra.es/NR/rdonlyres/D2F3E520-08FD-4178-ADB2-9C19384ADEFD/0/DeclaracionMujeresCC_cast.pdf

Local Adaptation Plan of Action of Ilam Municipality	Ilam Municipality	2024	Ilam, Nepal	https://myrepublica.nagariknetwork.com/news/a-paradigm-shift-in-local-climate-adaptation-in-ilam-municipality/ + file:///C:/Users/User/AppData/Local/Microsoft/Windows/INetCache/IE/H4WAQ8D9/CT-July-2023_ICCCAD_GJCSNepal[1].pdf
Community Resilience Assessment- Carlton Community report back	Participe Carlton	since 2022 (ongoing)	Australia (Melbourne)	https://hdp-au-prod-app-com-participate-files.s3.ap-southeast-2.amazonaws.com/9816/9104/1067/Carlton_CRA_report_to_workshop_participants_2023.pdf
Understanding thermal justice and systemic cooling poverty from the margins: intersectional perspectives from Rio de Janeiro	Antonella Mazzone, Enrica De Cian, Elias de Paula, Andreia Ferreira & Radhika Khosla	2023	Rio de Janeiro, Brazil	https://www.tandfonline.com/doi/full/10.1080/13549839.2024.2345610#d1e234

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