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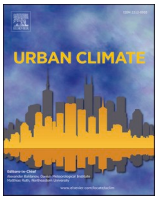

Intersectional climate justice: A conceptual pathway for bridging adaptation planning, transformative action, and social equity

Ana T. Amorim-Maia [a,b,*], Isabelle Anguelovski [a,b,c,d], Eric Chu [e], James Connolly [b,f]

[a] Institute of Environmental Science and Technology (ICTA), Universitat Autònoma de Barcelona (UAB), Edifici Z (ICTA-ICP), Carrer de les Columnes s/n, Campus de la UAB, 08193 Cerdanyola del Vallès, Spain
[b] Barcelona Lab for Urban Environmental Justice and Sustainability (BCNUEJ), Carrer Doctor Aiguader 88, 08003 Barcelona, Spain
[c] Hospital del Mar Medical Research Institute (IMIM), Carrer Doctor Aiguader 88, 08003 Barcelona, Spain
[d] Institució Catalana de Recerca i Estudis Avançats (ICREA), Passeig de Lluís Companys, 23, 08010 Barcelona, Spain
[e] Department of Human Ecology, University of California, Davis, One Shields Avenue, Davis, CA 95616, USA
[f] School of Community and Regional Planning (SCARP), University of British Columbia, 433 - 6333 Memorial Road, Vancouver, BC V6T 1Z2, Canada

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ABSTRACT

Local governments around the world are formulating different ways to address climate change. However, the compounding and overlapping vulnerabilities of historically marginalized residents are commonly tackled in a fragmented manner by conventional adaptation approaches, even when justice is presented as an overarching goal of these plans. In response, we propose an intersectional pivot in climate adaptation research and practice to analyze the interconnected forms of social-environmental injustices that drive vulnerabilities in cities, paving the way for more concrete and integrated strategies of just urban adaptation and transformation. This paper brings together narrative and analytical review methodologies to inform a new conceptual framework that highlights the need to (1) tackle underlying reinforcers of racial and gender inequalities; (2) redress drivers of differential vulnerabilities; (3) take politics and ethics of care seriously; (4) adopt place-based and place-making approaches; and (5) promote cross-identity forms of activism and community resilience building. We illustrate the framework with examples of ongoing projects in Barcelona, Spain, which is an early adopter of intersectional thinking and justice-driven principles in climate action. Although many initiatives are in a pilot phase and do not all exclusively focus on climate adaptation, experiences from Barcelona do provide illustrative directionality for innovative and integrated approaches that can address multiple and intersecting social-environmental inequities.

1. Introduction

Around the world, those cities that are engaging in climate adaptation planning continue to face compounding emergencies attributed to increasing gender-based and racially motivated violence, socio-economic inequality, crises of care, and, most recently,

* Corresponding author at: Institute of Environmental Science and Technology (ICTA), Universitat Autònoma de Barcelona (UAB), Edifici Z (ICTA-ICP), Carrer de les Columnes s/n, Campus de la UAB, 08193 Cerdanyola del Vallès, Spain.
E-mail addresses: anaterra.maia@uab.cat (A.T. Amorim-Maia), isabelle.anguelovski@uab.cat (I. Anguelovski), ekch@ucdavis.edu (E. Chu), jconnoll@mail.ubc.ca (J. Connolly).

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the COVID-19 global pandemic. The need to address these crises one-by-one can detract from comprehensive efforts towards more resilient and inclusive futures and, depending on the tools and strategies implemented, risk exacerbating already deep social, economic, and political divisions in cities. There is thus increasing urgency for planners and policymakers to adopt intersectional frames that tackle these inequalities in a holistic way, while simultaneously striving to expand capacity to build transformative sustainable futures.

This paper proposes a conceptual pivot to intersectionality as a way to coalesce the theoretically fragmented scholarship on climate adaptation planning and the normative principles, strategies, and values developed by practitioners to tackle social exclusion and vulnerability. Based in critical race theory and feminist studies, intersectionality notes how social characteristics such as gender, race, class, age, disability, and sexual orientation intersect each other to drive and exacerbate privilege, discrimination, and oppression (Ahmed, 2017; Crenshaw, 1989). Single focus lenses on social inequality (e.g., race, gender, or class) leave little space to address complex problems (Collins and Bilge, 2020), including those induced or exacerbated by climate change. For instance, we see cities promulgating innovative policies to tackle gender inequalities, as is the case in Barcelona (Ajuntament de Barcelona, 2016), or address racial injustice, as we see in London (London City Hall, 2020), but these actions are often self-contained. As a result, these policies tend to offer only a partial and de-contextualized response (Anguelovski et al., 2020; Ranganathan and Bratman, 2019). Therefore, our call for a pivot to intersectionality as an organizing principle for urban climate adaptation action seeks to formalize the recent conceptual shift away from technocratic and exclusionary forms of climate change planning (see Long and Rice, 2020) towards more socially transformative approaches that redress the drivers of diverse, underlying, and systemic inequalities (Anguelovski et al., 2020; Chu et al., 2017; Shi et al., 2016). We argue that prioritizing actions designed to simultaneously account for multiple inequities and associated compounding and overlapping vulnerabilities – across both space and time – is necessary to break free from processes that have continued to generate deep climate vulnerabilities in cities. In other words, an intersectional pivot can enable an integrated and socially transformative program that builds on past advances while taking into account power relations that hinder contemporary efforts (Phoenix and Pattynama, 2006).

Recent scholarship has similarly acknowledged the need for intersectional approaches to climate adaptation (see Djoudi et al., 2016; Kaijser and Kronsell, 2014; Owusu et al., 2019); however, this paper argues for a formalized conceptual pivot towards intersectionality and offers a framework for operationalizing intersectional thinking in climate planning and policy-making on the ground. To begin, we review recent literature on intersectionality and justice in climate adaptation, with the aim of proposing and consolidating a normative language focused on intersectionality and derived from existing scholarship in the area. Next, we describe our conceptual framework for intersectional climate justice, which includes five distinct subcomponents. We illustrate these subcomponents by using notable examples from Barcelona, Spain, as an emblematic pioneering city in both policy and practice for the advancement of a transformative vision for climate justice. Still, even though Barcelona showcases recent policies, plans, initiatives, and citizens' engagement around intersectionality and climate action, it remains a nascent and experimental process. Thus, we situate Barcelona within a community of other cities around the world that are thinking seriously about climate justice, highlighting a pathway towards transformation which, although fragmentary and contentious, can inform an ideal of intersectional climate justice.

Given the ongoing and preliminary nature of efforts in Barcelona and the scope of this article, our intention is not to provide a fully developed case study, but instead to highlight instances where the city is pursuing policies and projects to further intersectional thinking in its climate adaptation planning. By exploring these examples, we piece together potential pathways to realize intersectional climate justice on the ground. Our approach is perhaps best described as providing illustrative directionality for those seeking to develop a vision and struggle through the negotiated process of urban intersectional climate justice (Harris et al., 2017). We conclude the article by highlighting the larger implications of the frame we present for urban climate adaptation and development and outline limitations and opportunities for further research.

2. Methods

This paper brings together narrative and analytical review methodologies to provide a state-of-the-art overview of the main debates in the field, assess how the field is moving forward, and inform a conceptual framework that we then further illustrate with notable examples of climate initiatives from Barcelona. Narrative reviews are a valuable contribution to the literature as they provide comprehensive syntheses of targeted substantive issues based on previously published information, thus presenting a broader perspective on an otherwise elusive topic and describing the development of a problem or its management (Goodier, 1999; Green et al., 2006). Our goal is therefore to leverage the combined strength of narrative and analytic reviews to explore themes across recent scholarship and synthesize insights from multiple perspectives and disciplines (Sovacool et al., 2018). Given this goal, we do not pursue an exhaustive, quantitative, systematic review of all literature. Rather, we identify key themes, important insights, and suggest avenues for further research based on our reading of the literature, as well as develop a novel conceptual framework that ties together different fields of inquiry to advance critical social scientific research on urban adaptation going forward. This approach is useful and necessary since there is comparatively little simultaneous scholarly engagement with intersectionality, climate change adaptation, and urban justice.

Our review methodology was both inductive and deductive. We included specific searches based on pre-defined theoretical concepts (e.g., intersectionality, urban justice) and refined the topic and objective of the review through an analysis of further literature pertaining to the core topics (e.g., climate change adaptation, resilient cities), synthesizing a set of main takeaway points from this evidence. We began with a literature search in Web of Science, Scopus, and Google Scholar, identifying 432 articles that matched the pre-established theoretical concepts and filtering results based on relevance and year of publication. We screened titles and abstracts to identify peer-reviewed publications addressing intersectionality, intersectional approaches to climate studies, justice, and equity in

urban climate adaptation and resilience. We selected a subset of 168 articles based on their relevance to the core topics, although they did not need to address all the above-mentioned topics to be included in the narrative review, allowing for permeability and complementarity. We also prioritized relevant articles published between 1985 and 2021 in journals that included original empirical data or offered original theoretical contributions. We then searched for references and secondary citations in those papers, gathering pertinent articles cited by and within the results, until we reached a point that we considered representative of the state of the literature based on the four authors' backgrounds and repeated mentions of similar issues (i.e., saturation). We excluded articles which, after full-text screening, did not seem directly relevant to the topic (i.e., not concerned with urban issues or climate change adaptation). In the end, we arrived at a pool of 160 articles to review and synthesize scholarly critiques and identify theoretical gaps. Fig. 1 shows the process undertaken.

Our review informs an analytical framework that identifies five main components for advancing intersectional climate justice. This framework builds upon previous work by operationalizing intersectional thinking into urban adaptation practice, so that it can be, we argue, more inclusive, care-driven, and transformative. We illustrate this framework with brief examples of ongoing projects in Barcelona, Spain. We position Barcelona within a larger community of cities around the world that are implementing principles, policies, and planning tools to advance agendas associated with the subcomponents of our proposed framework. We do this using a two-stage approach, where we identify cities around the world that are considered among those that are pursuing transformative principles, policies, and programs on the ground. We identified these emblematic cities based on an analysis of recent reports published by relevant global organizations and research institutes (i.e., World Resources Institute,[1] Barcelona Laboratory for Urban Environmental Justice and Sustainability, Local Governments for Sustainability[2]), as well as informal interviews and professional exchanges with experts on the topic, including the authors of the reports. These exchanges were supplemented with extensive keyword and internet searches. This process shortlisted pioneering cities that are developing work at the intersection of climate justice, equity and urban sustainability, each bringing in different ways to tackle social inequalities, such as allowing for informality in Cape Town (Fox et al., 2021), empowering youth in Quito (Chu et al., 2019; Chu et al., 2016), combatting racism in Portland (Connolly and Anguelovski, 2021; Goodling, 2021), and assimilating Indigenous and local knowledge in climate action in North American cities (Mustonen et al., 2021). We apply these other examples to contextualize individual actions in Barcelona and reflect on how intersectional climate adaptation actions can be furthered.

We chose to highlight Barcelona as an emblematic city due to its wide base of action relative to other early adopter cities. In short, our review showed that the city displays a comparatively wide range of justice principles for climate action with intersectional lenses on vulnerability across a variety of urban policies and interventions. Ada Colau, Mayor since 2015, is the first woman to hold the office and places feminism, the fight against inequalities, promoting a more caring city, public participation, and the climate emergency at the center of her governance approaches (Ajuntament de Barcelona, 2020a; Ajuntament de Barcelona, 2013, 2015, 2018). We draw upon governmental plans, by-laws, policies, and projects that detail Barcelona's stated commitments to create a fairer and more inclusive city while championing climate community-centered action. Annex 1 shows a list of the documents accessed, which were located through extensive internet searches and keyword research in the City Council's open knowledge repository, as well as official city websites, and their individual department online archives. We distilled those documents building on the main analytical concepts of this paper and identifying relevant projects and approaches. Although not all plans, policies, or projects are explicitly related to climate adaptation, many call for new transversal institutional practices across planning domains and sectors. In that sense, they plant new narratives and imaginaries about what planning for intersectional climate justice can look like in the city.

3. Intersectionality and climate studies

Intersectionality is a core conceptual lens to understand how various forms of social inequalities and vulnerability interconnect and overlap with each other. With roots in Black feminist thought, proponents of the theory posit that different social identities and categorizations – such as gender, race, socioeconomic class, cultural and ethnic background, age and disability – combine to create unique modes of disadvantage and oppression (Crenshaw, 2017; Crenshaw, 1989). It is a push to look beyond the effects of any one social driver (e.g., racism or sexism) and towards the forces that simultaneously generate power imbalances across multiple drivers as the sources of injustice.

Intersectionality does not only concern categories of identities, but it also embraces the complexities that are essential to understand entrenched social, political, and structural inequalities (Cho et al., 2013; McCall, 2005), which in turn translate into different kinds of vulnerabilities and unequal caring needs and responsibilities (Hankivsky, 2014a). On that premise, intersectionality builds on care ethics and prescribes "good care" practices that shift away from historic – often racial and gendered – hierarchies constraining who is responsible for care versus those who are deprived from it (Raghuram, 2016). Hence, intersectionality is a key theoretical resource to understand, confront, and transform the entrenched interlocking power inequalities that govern the (mal)distribution of care (Hankivsky, 2014b), further developing and advancing the debates on political ethics of care (Collins, 1991) and the (re)production of care inequities (MacGregor, 2006). Moreover, intersectionality is committed to the structural dimensions of the context (Crenshaw, 1991), acknowledging the role played by place and space in shaping people's perceptions and experiences of privilege, discrimination, and oppression (Davis, 2008). Ultimately, intersectionality is inextricably linked to an analysis of power relations and structures of subordination (Johnson et al., 2020), encouraging cross-identity forms of activism and community responses that can

[1] https://wrirosscities.org/research/publication/unlocking-potential-transformative-climate-adaptation-cities
[2] http://www.bcnuej.org/projects/green-trajectories/

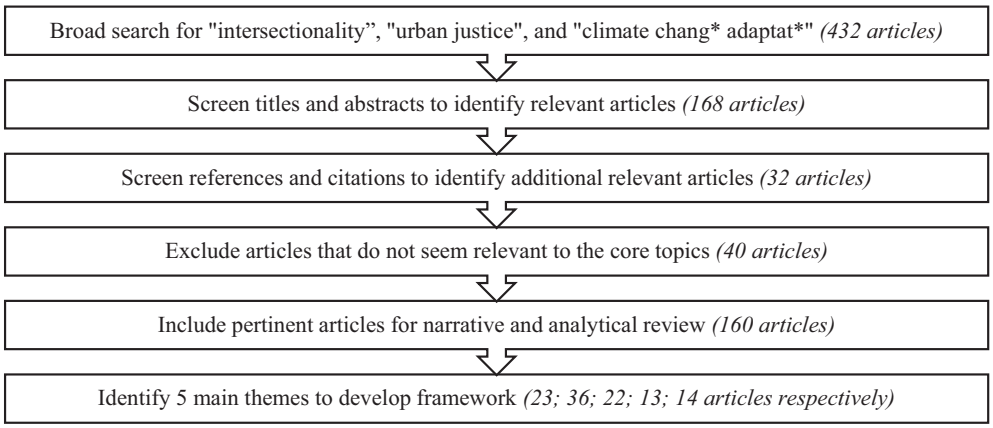

Fig. 1. Literature review process and results of each step.

bring about justice-oriented change (Collins and Bilge, 2020). It is within this theoretical backdrop that we develop our frame to operationalize intersectional thinking into urban climate adaptation.

Intersectionality has been increasingly adopted as an analytical framework in different fields, ranging from gender and feminist studies (Ahmed, 2017; Nash, 2008; Shields, 2008), and psychology (Cole, 2009), to organizational studies (Acker, 2006). In this paper, we focus on intersectionality as a framework to guide justice-oriented transformations in urban environmental planning and, more specifically, in climate change studies. We thus respond to the need for more holistic, multiscale, and integrated approaches to justice in climate adaptation (Coggins et al., 2021). Such an approach calls for academics and planners concerned with urban justice to (1) analyze how residents decipher, sense, and occupy spaces (even in more invisible and heterodox manners) while distilling multiple, concurring exposures to environmental risks, insecurity, and inequalities, and (2) interpret those identities and experiences in different historic moments and spaces (Anguelovski et al., 2020).

In the context of justice in climate change, intersectionality is increasingly being applied to examine the overlapping and interdependent systems of disadvantage and oppression that restrict people's adaptive capacity and create new or exacerbate existing social-ecological vulnerabilities (Djoudi et al., 2016; Kaijser and Kronsell, 2014). Examples of intersectionality can also be found in climate mitigation, such as in energy transition (Cannon and Chu, 2021; Johnson et al., 2020) and land restoration (Thompson-Hall, 2016) literatures. However, most of these studies focus on agrarian settings in the Global South (Carr and Thompson, 2014; Thompson-Hall et al., 2016), for example access to secure land for women farmers in India (Ravera et al., 2016b), Ghana (Lawson et al., 2020) and South Asia (Sultana, 2014). Literature on intersectional approaches to climate change in urban contexts is insipient, with a few exceptions (e.g., Wilson and Chu, 2019). Yet, with well-documented multiple forms of climate injustice faced by people of color, low-income, and migrant communities in today's cities (Anguelovski et al., 2019), together with increasing pressures posed by climate change on cities' infrastructures and services, it is essential to apply an intersectional lens to urban climate studies to help uncover the interconnected and lasting systems of oppression and disadvantage that drive and sustain vulnerabilities in cities while depriving some groups of ecological benefits (Connolly and Anguelovski, 2021), so that adaptation strategies can be more boldly inclusive and just.

In fact, research indicates that traditional urban climate adaptation practice has taken exclusionary, inequitable, and technocratic approaches, which have aggravated the structural causes of vulnerability and undermined the need for deeper social reforms (Chu et al., 2017; Meerow, 2017; Robin and Castán Broto, 2020). For instance, studies have shown that climate adaptation and resilience developments tended to overlook historic and ongoing patterns of uneven and inequitable development, leading to worsening social and environmental vulnerabilities for marginalized groups and causing unjust and maladaptive externalities – even when pursued under the intent of justice (Anguelovski et al., 2019; Anguelovski et al., 2016; Connolly, 2018; Shokry et al., 2020).

An intersectional pivot would respond to the heaviest critiques of recent climate action by analyzing and addressing the interconnected forms of social-environmental injustices that drive vulnerabilities in cities. It fundamentally differs from traditional (i.e., technocratic, sectoral) adaptation planning and practices (Westman and Broto, 2021) by encouraging strategies that support the current and long-term intersecting vulnerable identities and needs of underprivileged groups while creating new opportunities for a more inclusive and resilient city at both the individual and community level. Thus, an intersectional pivot in climate adaptation can pave the way for more concrete strategies of urban transformation that challenge social power imbalances and break away from dominant political economic interests (Devereux and Sabates-Wheeler, 2004; Kates et al., 2012; O'Brien, 2012; Pelling, 2010).

However, despite a wide range of adaptation critiques and justice-oriented strategies, these approaches are presently fragmented both in theory and practice and rarely take intersectional needs, identities, and vulnerabilities into consideration. We argue that an intersectional pivot in urban climate can help to orient justice-focused adaptation actions on the ground around normative goals, empirically informing urban transformations. Next, further building on specific themes in the literature, we propose a conceptual framework with five key components that cities must focus on to devise more integrated, intersectional, and transformative adaptation solutions, which can help to promote climate action while taking into account place-based and historic legacies of socioeconomic and environmental injustices.

4. Intersectional climate justice – a conceptual frame for urban adaptation planning

In this section, we bring together the various bodies of theory noted earlier to propose a conceptual framework with five subcomponents that are essential for cities seeking to operationalize intersectional thinking in urban climate adaptation. The five subcomponents emerging from our review point to the need to: (1) tackle underlying economic reinforcers of racial and gender inequalities; (2) redress differential vulnerabilities; (3) take ethics and politics of care seriously; (4) adopt place-based approaches, especially those promoting invisible or unmapped senses of place and place-making; (5) and promote cross-identity and vulnerability activism and community resilience building. To each of these subcomponents we offer a theoretical description and critique followed by brief empirical examples of policies and projects in Barcelona and elsewhere that are attempting to address these issues in transformative ways. Fig. 2 illustrates the five subcomponents of the intersectional climate justice frame and Table 1 summarizes them. It also articulates drivers behind injustices and pathways to achieve intersectional climate justice.

4.1. *Tackle underlying systemic reinforcers of racial and gender inequalities*

The concept of intersectionality aims to address the fact that the experiences and struggles of women of color have fallen between the cracks of both feminist and antiracist discourse (Crenshaw, 1989). Thus, the first component of the intersectional climate justice framework picks up this critique to recommend that specific attention be given to the role of past racial and gender-based violence in the (re)production of social inequalities, recognizing the systematic devaluation of female and nonwhite bodies and its assimilation into economic processes (Pulido, 2017; Robinson, 2000). Hence, this component suggests adopting a more intersectional conception of capitalism than traditional Marxist theory, recognizing its deeply racialized, sexist, and colonial nature (Federici, 2004; Pulido, 2016; Virdee, 2019). This means acknowledging that - beyond proletary exploitation and dispossession - capitalism has relied on the consistent oppression of racial minorities and undervaluation and invisibilization of women's work, transforming them from co-producers of common wealth into reproducers of the capitalist workforce (Federici, 2004; Melamed, 2015).

These deeply embedded injustices of historic racism and sexism are reflected in contemporary communities' capacity to cope with and adapt to climate change. There is growing recognition that the impacts of climate change have a disproportionate effect on women, Black, Indigenous, and low-income communities (Costello et al., 2009; IPCC, 2012). Research has shown that these groups tend to be more vulnerable to the effects of climate change because they are less likely to own land and resources, have less education and training, less access to institutional support, health services, and information, and fewer opportunities to participate in decision-making (Alston and Whittenbury, 2013; Denton, 2002; Nelson, 2012; Röhr, 2006). Despite that, we do not suggest that intersectional climate justice calls for reproducing simplistic portrayals of poor, Black, and Indigenous women as the main victims of environmental degradation while at the same time reinforcing a narrative that they have greater environmental awareness (Johnsson-Latham, 2007), positioning them as 'eco-warriors' (Resurrección, 2017), and community leaders towards resilience (Enarson, 2013; Veuthey and Gerber, 2012). Such a simplified approach to underlying race and gender inequalities attributes yet another responsibility to the already long list of caring roles. Rather, an intersectional lens pushes back against reductionist narratives to the extent that they

Fig. 2. Intersectional climate justice: a conceptual framework for urban adaptation planning.

Table 1
Intersectional climate justice framework subcomponents, drivers of injustices and pathways to achieve intersectional climate justice.

Component	Driver of injustice	Intersectional climate justice pathways
Tackle underlying systemic reinforcers of racial and gender inequalities	- Racial and gendered capitalism - Gender- and race-blind climate policies	- Recognize and question economic reinforcers of racial and gender inequalities - Dismantle systems of gender and racial oppression and subordination - Devise racial and gender equality goals in key regulations, plans and programs
Redress drivers of differential vulnerabilities	- Historical and structural inequalities, pre-existing risks and urban vulnerabilities - Exclusionary land use planning, zoning, and unequal enforcement of land use regulations	- Consider historic legacies of social and environmental injustices in adaptation planning - Address enduring inequality in land use planning - Include the most vulnerable in decision-making
Take politics and ethics of care seriously	- Cities centered on productive over reproductive work - Austerity, devaluation, and crisis of care	- Rethink planning from a care perspective, putting caring relations, reproductive uses, and self-care needs at the fore - Recognize and value unpaid care, reproductive and other forms of invisibilized work - Set measures and services that regenerate people's physical and emotional wellbeing
Adopt place-based and place-making approaches	- Colonial, scientific, technocratic, and expert-driven approaches to planning and development - Policed state and disciplined landscapes and practices	- Foster decolonial / postcolonial approaches to planning and development - Recognize traditional, situated, and local knowledge arising from diverse and often invisible experiences of place and space - Arrange reparations and access to land and natural resources for marginalized residents
Promote cross-identity climate action and community resilience building	- Limited citizen involvement and engagement in adaptation planning, implementation, and evaluation - Limited or tokenistic civil society participation	- Empower local communities to manage their resources and lead the change - Invest in mentoring programs leveraging local leaders and promoting stewardship opportunities - Support participation and representation of, and training/business opportunities for minority-focused organizations and social movements

further disempower those who are socially oppressed and deflect attention from the power relations that perpetuate social inequalities (Bell, 2013; Jerneck, 2018).

In contrast, this subcomponent of our understanding of intersectional climate justice highlights the condition wherein, despite being the most negatively affected by climate change, women and racial and ethnic minorities remain under-represented in adaptation planning and decision-making processes (Kelly and Adger, 2000; McManus et al., 2014; Resurrección et al., 2019), which are often still dominated by technocentric approaches that perpetuate adaptation as the exclusive domain of experts and elite actors, while neglecting local needs, traditional knowledge, and historical struggles (Anguelovski et al., 2019; Haverkamp, 2017). The result is often climate policies that are race- and gender-blind, which risk leaving the deeply embedded injustices of historic and contemporaneous racism and sexism untouched, while exacerbating injustices and producing new tensions over time.

To avoid the perpetuation of biases, injustices, and intersecting forms of discrimination, climate policies seeking to internalize the intersectional approach would focus on the embodied experiences of environmental and climate struggles, with a particular critique of racist and sexist legacies that make cities unsafe, climate-insecure, productivity and consumption focused, and exclusively benefiting the few. To do that, it is necessary to prioritize policymaking approaches that heed to the intersecting identities, perspectives, and needs of historically marginalized groups, adopting planning approaches that are intrinsically feminist and antiracist. Thus, the first pillar of this frame calls for taking steps towards a transformation of the oppressive systems and structures that reinforce racial and gender inequalities, examining, questioning, and redressing the power dynamics that have reified privilege and disenfranchisement throughout history.

Barcelona is an emblematic city which has started to embed feminist policies in its governance structure. In 2016, the City Councilor's Office for Feminism and LGBTI Affairs launched the "Plan for Gender Justice (2016-2020)" (Ajuntament de Barcelona, 2016), aimed at combating gender inequalities and transforming the city from a feminist perspective. Its goals included strengthening mechanisms for the political, social, and technological participation of female residents, as well as rethinking public spaces, infrastructures, mobility, housing, social, educational, and health care services from the principle of gender fairness. In March 2017, the City Council introduced the government bill "Urban planning with a gender perspective. The urban planning of everyday life", which incorporates a gender perspective to all urban projects, situating everyday life at the heart of Barcelona's urban policies and applying an inclusive perspective to respond to the needs and desires of society as a whole (Ajuntament de Barcelona, 2017a). Among the actions proposed are the planning of public and green spaces from a gender perspective, such as the super blocks in Sant Antoni, which were based on participatory diagnostics and proposals for a feminist transformation in the urban model at the local level (Ajuntament

de Barcelona, 2019a, 2019b). Since 2016, these policies have been gradually implemented across municipal sectors and systems, but this is still an initiative working from outside of planning to change climate action, so it is too early to assess the larger social impacts and political implications. While Barcelona is at the forefront in achieving gender equality and supporting the rights of international migrants and refugees, the city is not as advanced yet in the fight against the structural racism that long-term racialized minorities are facing in, for example, housing security or job hiring practices (García-Lamarca, 2022), pointing to approaches that although transversal, must incorporate more axes of vulnerability.

Moving beyond Barcelona, the city of Portland, Oregon, in the United States presents an example of climate action with an anti-racist approach. Portland has a long history of environmental racism, from redlining policies in the 20th century to the ongoing exclusion of non-white and low-income populations from green amenities, as studies on the city have recently shown that racialized populations experience disproportionate exposure to extreme heat and have less access to refuge from high temperatures, be it green spaces or cooling centers (Nesbitt and Meitner, 2016; Voelkel et al., 2018). To counter that trend, Portland launched in 2017 a Five-Year Racial Equity Plan to address historical and current disparities in parks distribution, access and quality, as an attempt to reveal the city's history of urban racial exclusion and become a leader in equitable greening and sustainable urban living in North America (BCNUEJ, 2018; Goodling et al., 2015; Portland Parks and Recreations, 2017). While Portland presents an aspiring example of policymaking for racial and environmental justice, it continues to be a plan built on a single axis of inequality (race) thus not inherently intersectional.

4.2. Redress drivers of differential vulnerabilities

Intersectionality is not exclusively preoccupied with categories of identities, but also with political and structural inequalities (Cho et al., 2013), which are deemed underlying drivers of climate vulnerability (Shi et al., 2016). Thus, the second component of the intersectional climate justice frame is the acknowledgement and rectification of differential vulnerabilities. The concept of differential vulnerability emerged from a pursuit driven largely by feminist scholars to better understand the nuances of vulnerability and its relations with gender, cultural and social norms, race and ethnicity, age and religion (Blaikie et al., 1994; Cardona, 2004; Denton, 2002; Nelson et al., 2002). Rather than a stationary attribute of certain populations, differential vulnerability is a function of compounding risks (i.e., conflicts, natural disasters, pandemics) and intersecting axes of social differences (i.e., gender, racial, socioeconomic inequalities), which can coexist and aggravate each other (Cardona et al., 2012; Soares et al., 2012; Thomas et al., 2019; Vancura and Leichenko, 2015). Thus, the integration of an intersectional perspective is essential as it helps analyze and understand the ways in which axes of social inequality intersect with climate impacts, hazards, and crises to create diverse experiences of oppression and vulnerability in different contexts (Kuran et al., 2020; Ravera et al., 2016a).

Despite a growing body of work on adaptation strategies to address differential vulnerabilities (Berrouet et al., 2017; Soares et al., 2012; Tapia et al., 2017), research is yet to elucidate how adaptation projects can redress pre-existing and intersecting drivers of differential vulnerability in urban contexts, with a few exceptions (e.g., Chang et al., 2021). The understanding of differential vulnerabilities to climate change in urban contexts is timely not only because cities house the majority of the world's population, but also because a changing climate poses threats to high numbers of urban residents, affecting basic infrastructures, networks and services, as well as economic and health systems (Tapia et al., 2017). For instance, flood exposure is expected to cause significant global financial and material losses in cities (Douglas et al., 2008; Hallegatte et al., 2013), while warming temperatures are likely to disrupt power supplies, increase vulnerability to heat stress, and intensify health inequalities (Harlan et al., 2006; McMichael et al., 2008). These impacts are likely to intersect with other risks and crises - i.e., poverty, crime, racial and gender-based violence, and pandemics (Davies et al., 2020) - and pre-existing urban vulnerabilities, such as precarious access to infrastructures and services, weak institutional structures, lack of secure tenure, and limited political agency (Satterthwaite et al., 2007), imposing additional burdens on urban communities who are least able to cope (da Silva et al., 2012). They will also likely intersect with new risks such as those triggered on to marginalized groups by the Covid-19 pandemic (Pelling et al., 2021).

A significant trigger of injustice in adaptation planning is cities' increasing reliance on intergovernmental and private sources of finance for climate-resilient development. A study of the first 25 years of adaptation finance (from the signing of the UNFCCC in 1992 to 2018) through a climate justice lens found that adaptation finance has moved away from climate justice towards neoliberal principles, with a growing emphasis on private finance and market-based strategies and increasingly inadequate and unfair distribution of funds (Khan et al., 2019). While there is certain indication that climate finance can reduce climate-related risks in poor communities by enhancing agency (Barrett, 2013), studies have also shown that the increasing reliance on private finance has allowed real estate and investment firms to seize land and benefits for adaptation, while further marginalizing, invisibilizing, and displacing vulnerable residents (Robin and Castán Broto, 2020; Teicher, 2018). One outcome of this process is a phenomenon known as climate or resilience gentrification, in which increases in land and property prices driven by adaptation initiatives – such as new green areas, pedestrianized zones, and bike lanes – force low-income and minority residents to relocate, while attracting residents with a higher economic status to previously undesirable neighborhoods (Anguelovski et al., 2018; Gould and Lewis, 2018; Keenan et al., 2018; Porter et al., 2020).

To combat unsustainable urban growth and neoliberal development models and to prioritize social vulnerability in urban resilience (Connolly, 2018), cities must take into account historic legacies of social and environmental injustices, including unequal land and housing rights and inequitable zoning regulations (Connolly and Anguelovski, 2021). This involves stronger regulations of private finance-driven resilience work, including policy and planning tools that promote housing stability and affordability, while increasing the presence and accessibility of green, climate-adapted public spaces in the city (BCNUEJ, 2021). In addition, to avoid displacement and inequitable green development, cities must improve multilevel and multi-actor governance, fomenting institutional reforms that

support participatory planning and that include the most vulnerable in decision-making (Shi et al., 2016). To avoid tokenism in participation, diversity and inclusion, governance processes must commit to meaningful participation of different sectors of society, building bridges between stakeholder groups and tapping into existing local community networks (Chu et al., 2019).

On this front, Barcelona is driving initiatives to reduce differential vulnerabilities through policies that prioritize housing and land rights, ensuring the ability of lower-income and minority residents to remain in place. Examples include regulations on touristic/short-term rental apartments, property tax support for homeowners, and a minimum of 30% of social housing units in any new real estate development (BCNUEJ, 2021). On the equitable greening front, the city is fighting the negative impacts of unequal access to greening in historically marginalized neighborhoods through projects that seek improved access to and inclusiveness of urban green amenities. One such project involves the creation of a "network of climate and care refuges with a community and ecofeminist perspective" in the city's most vulnerable district Nou Barris. These climate and care refuges will connect public facilities and spaces of daily use, such as schools, primary care, and sports centers, through green and grey infrastructure interventions, which will provide public, safe, and shaded spaces to take shelter during hot days and allow for caregiving activities. These spaces will be collectively designed and planned by local residents, prioritizing the participation of marginalized populations, who will receive financial compensation for their work. This generates job training and skills development opportunities for those who face difficulty finding paid work (particularly women migrants, caregivers, people with functional diversity or over 45 years old), pointing to innovative ways in which intersectional approaches can help redress differential vulnerabilities and create greater financial security for vulnerable groups. The project also envisages creating new opportunities for care and solidarity work by engaging local residents in the care of children and older persons during the construction of the space, thus recognizing and valuing informal, domestic, and care work. Fig. 3 shows the proposed areas for the implementation of the climate and care refuges and Fig. 4 shows Plaça Angel Pestaña, the central square of the neighborhood.

Nevertheless, the plan is not fundamentally addressing drivers of unequal and uneven (climate-sensitive) development in Barcelona such as real estate construction and development, dependence on mass tourism, or its connected concentrated profit economy.

Looking at additional experiences, Kansas City, Missouri, in the United States presents an example of a district-wide revitalization initiative, with the creation of a "Green Impact Zone" in which a declining district was transformed into a thriving and sustainable area with improved housing, community services, health and employment programs (BCNUEJ, 2018). In the United Kingdom, Bristol has developed innovative ways to address social and environmental inequalities with the requirement of an "Equalities Impact Assessment" for all new policies, striving to develop integrated green infrastructures and public amenities that address the specific needs of vulnerable groups (ibid.). These interventions point to innovative strategies and approaches that foster neighborhood revitalization and greening while preventing displacement and gentrification, with a particular focus on vulnerable groups.

Fig. 3. Proposed areas for the implementation of the Climate and Care Refuges (in orange), covering a 200-m radius in relation to the Plaça Angel Pestaña (in blue). It connects schools, high schools, civic centers, retirement homes, a primary health center, a sports pavilion, churches, a mosque, and several shops and supermarkets (Diagram: Collectiu Punt 6, Google Earth, 2019). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Fig. 4. Plaça Angel Pestaña, a hard-paved square at the center of the neighborhood and the Casal de Barri Prosperitat in the background, which concentrates much of the local cultural and civic activities (author's own photo).

4.3. Take politics and ethics of care seriously

Intersectionality embraces the complexities that are essential to understand entrenched social inequities, which in turn manifest in care inequities (Bowleg, 2012). Thus, the third component of the intersectional climate justice framework entails taking the politics and ethics of care seriously, understanding and valuing care as a form of labor essential to social reproduction (Held, 2006; MacGregor, 2006). In capitalist societies of the global North, the model of distribution of production and care has assigned to men (understood as white, heterosexual, cisgender and able-bodied) the productive tasks of wage labor in the public space, while women have traditionally been relegated to the reproductive and unpaid tasks of caregivers in the private space of the home, thereby also leaving little time for self-care. This model has not only crossed the structure of households and the labor market, but also public policies and the very configuration of cities and living environments (Greed, 1997; Hayden, 1985). Care is therefore a moral orientation which has been feminized and privatized in global North societies and, to this day, unpaid and/or undocumented care work continues to be exploited as an instrument to facilitate economic restructuring and the dismantling of the welfare state (Aguirre et al., 2014; MacGregor, 2006; Raghuram, 2016). Moreover, politics of care relates to intersectionality in the division of "nurturant" or rewarding care (i.e., teaching, nursing, social work) and "non-nurturant" or "dirty" care work (i.e., cleaning, coming in contact with bodily products or unclean substances) (Duffy, 2011). The former is primarily done by white women and the latter by women of color, migrants, and working-class people, who are forced to care (Glenn, 2012), taking up the invisible dirty work that is often rejected and outsourced by the better-off (Ehrenreich and Hochschild, 2004).

For urban climate adaptation, the ethics of care offers a feminist moral approach which is still largely missing in existing literature (Adger et al., 2017; Tronto, 1993). Initial adaptation efforts have been characterized as relying on scientific and economic assessments of vulnerability to natural hazards associated with infrastructures and services, often overlooking other types of vulnerability associated with anthropogenic risks, social crises, and economic inequalities (Smit and Wandel, 2006). This, in addition to cities' increasing reliance on private sources of finance for climate adaptation, implied the pursuit of technological interventions that favored private political economic interests, perpetuating relations driven by profit, competition, production, and consumption over general wellbeing and sustainability. Conversely, by focusing on new forms of relationships, institutions, and actions that enhance trust, mutuality, well-being, and solidarity while also taking the politics and ethics of care seriously, we recognize care and reproductive functions as a form of labor that must be distributed fairly if intersectional climate justice is to be realized (Lawson, 2007).

As we take ethics of care seriously, we bring to the fore the historical agency of reproductive and subsistence workers that take care of the biophysical conditions for human reproduction (Barca, 2020; Federici, 2013). To break the vicious circles of unequal care, cities must rethink urbanism from a care perspective. This includes formulating public policies in the fields of care, reproductive, and domestic work, and setting measures, practices, and services that regenerate people's physical and emotional wellbeing and allow for self-care. This subcomponent also entails the promotion of caring, social and solidarity economy (SSE) practices, pointing to pathways

that not only facilitate sustainability, resilience, and needs provisioning, but also question structural modes of growth and finance as well as social and power relations (Utting, 2015). SSE focuses on values such as equity, inclusion, participation, and a commitment to the community, and helps improve society by creating jobs, providing services, connecting with the territory, supporting social causes, and collaborating with transformational social movements (Rossel et al., 2015). Ultimately, the ethics of care in adaptation is a call for cities to provide public policies, services, and infrastructures that value, support, and guarantee (giving and receiving) care as a human right.

Barcelona is a unique example of an early adopter of care policies and institutionalization of ethics of care within decision-making, although not explicitly associated with climate adaptation. In 2017 the City Councilor's Office for Feminism and LGBTI Affairs launched a "Government Bill for Democratizing Care Work" (Ajuntament de Barcelona, 2017b). Driven by the Commissioner for Cooperative, Social and Solidarity Economy, the bill consisted of 68 initiatives geared towards a fairer distribution and responsibility of care work from an intersectional perspective, seeking to turn Barcelona into a pioneering "Caring City" (Chinchilla, 2020; Valdivia, 2018). Tasked with a clear transformational and feminist purpose, the Caring City aims to provide a tool to help bring recognition to the social value of care work and to ensure the right to care and be cared for under fair conditions. This bill is particularly timely given the outbreak of the coronavirus pandemic in 2019–2021, which intensified the "care work crisis" (Kent et al., 2020) and laid bare the inability of the economic and social systems to guarantee the wellbeing of the population's broadest sectors. In the context of the "Caring City", Barcelona launched two pioneering initiatives around care with a community perspective: the Care Superblocks and the VilaVeïna project. Launched in 2018, Care Superblocks offer integrated health and social services to local communities. Considered a benchmark model based on proximity, the system employs small teams of ten to fifteen specialized professionals who care for forty to sixty people living in the same residential area. Barcelona's City Council plans to expand from its current eight to 120 Care Superblocks by 2025, establishing care communities across all neighborhoods (Ajuntament de Barcelona, 2020b). Along the same line, the Vila-Veïna is a pilot project to bring support, resources, and advice related to care to local communities, through "social superblocks" that provide socially organized, better distributed, and more equitable care. The city plans to expand from its current four to 115 units, providing emotional support groups, shared parenting spaces, support for community care projects, as well as legal and labor advice for domestic and care workers (Boada, 2021). Besides services and resources, each unit will develop an urban transformation plan from a feminist care perspective, in line with the Care Superblocks and the Superblocks model (Ajuntament de Barcelona, 2020c, 2021a, 2021b).

While these initiatives show Barcelona's progressive initiatives around politics of care, as discussed, none of these initiatives is directly associated with climate adaptation or environmental measures, pointing to governance approaches that are potentially siloed. By adding a climate or environmental lens to the Caring City initiatives, Barcelona would value not only the types of care work that focus on those who are dependent or need help, but also all the work necessary to preserve and repair our world, including our bodies and our environment, thus acknowledging that they are all interwoven in a life-sustaining web (Fisher and Tronto, 1990). At the same time, it would mean acknowledging nature's contribution to people's physical and emotional wellbeing (Kabisch et al., 2017), thus improving the offer of green public spaces that cater for reproductive uses and self-care needs.

Beyond Barcelona, few examples to our knowledge exist at the city scale. At the country level, countries like Uruguay are recognizably at the forefront of institutionalizing public care policies that seek to promote visibility to care work and transform gender relations on a national scale. In 2010, the country launched its national care plan, which promotes care as a universal human right, and gives visibility to non-paid work and its value for social welfare and the economic system (Junta Nacional de Cuidados, 2015). This visibility was enabled by the measurement of non-paid work through country-wide time use surveys, which led to the formulation of public policies designed to transform unequal gender relations (Aguirre et al., 2014). Another example of institutionalization of care policies comes from Ecuador, which included non-paid reproductive work in its 2008 constitution, and in the strategic goals of its National Plan for Buen Vivir (see Section 4.4). Here, as well, the institutionalization of time use surveys was instrumental to expose the sexual division of labor and women's work overload, raising the visibility of these issues in public debate (Batthyány, 2015). More recently, the National Plan for Buen Vivir also recognized the importance of reproductive work as a fundamental axis of a model of development that is solidary and equitable, and that satisfies people's needs – accounting for diverse individual and collective identities - in peace and harmony with nature (Plan Nacional para el Buen Vivir, 2017).

4.4. Adopt place-based and place-making approaches

Intersectionality embodies a commitment to the situatedness of all knowledge (Haraway, 1988) and the structural dimensions of the context (Crenshaw, 1991). It acknowledges the role played by place and space in shaping people's perceptions and experiences of privilege, discrimination, and oppression (Davis, 2008). The fourth component of the intersectional climate justice framework therefore stresses the importance of adopting approaches that are centered on local communities and their relationship with the characteristics and meaning of places. Place-based planning emphasizes adaptation approaches that are context-specific and locally-led, placing the knowledge, priorities, and needs of historically disadvantaged residents at the center of urban decisions (Olazabal et al., 2021). This implies moving away from expert-driven and technocratic approaches towards a model of adaptation that integrates local and vernacular knowledge, particularly the traditionally overlooked knowledge of women, racial minorities, and immigrants (Anguelovski et al., 2019). These approaches question the dominance of traditionally privileged classes in the design and construction of urban spaces while promoting community ownership over their co-designed, co-created, and co-managed assets, thus promoting spaces that are socially constructed and comprise the histories and everyday life of those who build and use it. The focus on place also sheds light on the complexities of racialized geographies, especially those shaped by histories of (neo)colonialism, slavery, and contemporary practices of racism. These approaches demand an engagement with the different senses of place and place-making

practices that historically marginalized groups – especially racialized, gendered, and immigrant minorities – construct in unmapped and heterodox manners, away from dominating planning schemes and practices (McKittrick, 2011). Thus, we recognize place-based struggles as subaltern strategies of localization and call for the use of informal, contested, and invisible urban spaces as protected spaces and refuges for those residents (Anguelovski, 2014; Escobar, 2001).

Traditional urban adaptation has relied historically on colonial, scientific, and expert-driven approaches to planning and development, which have exacerbated historic injustices and unequal outcomes such as unfair distribution of land use power, natural, and financial resources (Heckert and Rosan, 2016; Meerow et al., 2019; Pelling and Garschagen, 2019). To combat the uneven distribution of adaptation costs and benefits, this subcomponent promotes a set of actions to: (1) arrange reparations and access to land and natural resources for marginalized residents; (2) foster decolonial approaches to planning and development, including right to place and right to return; (3) recognize traditional, situated, and local knowledge arising from diverse and often invisible experiences of place and space. This subcomponent also encourages the reflection of the conditions in which knowledge is produced, as well as the social identities and locations of the knowledge producers. This means paying sustained attention to traditional Indigenous and local leadership and knowledge systems. Place-based approaches offer the potential to contest colonial and Eurocentric ontologies, recognizing and valuing traditional social philosophies such as *Buen Vivir* (loosely translated as 'Good Living' from the Ecuadorian Quechua *'Sumak Kawsay'*). Influenced by both Andean Indigenous worldviews and western political philosophies – especially feminist thought, postcolonialism and environmentalism – Buen Vivir describes a way of doing things that is community-centric, ecologically-balanced, and culturally-sensitive, focusing on well-being of both nature and human beings (Gudynas, 2011). Buen Vivir is contemplated as an emerging narrative on development in the latest Barcelona Cooperation for Global Justice Plan (2018–2021) (Direcció de Justicia Global i Cooperació Internacional, 2018) and is increasingly part of the urban agenda in the form of conferences and cultural events (e.g., Chávez Ixcaquic, 2016).

Another way in which Barcelona is adopting place-based approaches is the project "Climate shelters in schools". Launched in 2019, the project aimed at transforming schoolyards considered vulnerable to heat into so-called 'cool islands' open to all citizens, through innovative techniques that apply green (vegetation and shading), grey (improvements in insulation and ventilation), and blue (incorporation of water points) measures (UIA, 2020). The adaptations followed a micro-local model of governance, where students, the educational community, and various institutions and experts co-designed the spaces based on their specific needs (Ajuntament de Barcelona, 2020d). The definition and follow up of the measures were part of an educational project that focused on climate change information and training. Students also participated actively in the monitoring and evaluation of the measures together with research and public institutions, focusing on climatic, health and wellbeing indicators. Thus, learning has been rooted in students' and staff's own place and space (e.g., their schoolyard, neighborhood, community), fostering their sense of place while solving community problems.

In one year, the pilot project transformed eleven schools into climate shelters, replacing 1000 m^2 of concrete with soil and vegetation, adding 2213 m^2 of new shaded spaces with pergolas and awning, planting 74 trees and installing 26 new water points.

Fig. 5. Courtyard of a school which underwent the project "Refugis Climàtics a les Escoles" in Barcelona, where one can see new green interventions (vegetation and shading). Source: (Ajuntament de Barcelona, 2020f). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Fig. 5. shows a school courtyard after the new interventions. While the chosen schools were evenly spread across the city (one by district), several were in wealthy and privileged areas. Although this choice does not diminish the environmental value of such initiatives, adaptation projects are shown to have a greater social impact on poorer neighborhoods, where residents are generally more vulnerable to heat (e.g., due to advanced age or pre-existing chronic medical conditions) and have less access to cooling options (Nesbitt and Meitner, 2016; Voelkel et al., 2018). These neighborhoods also tend to be more racially and ethnically diverse and have lower household income and level of education, although there also seems to be a greater effort to integrate the knowledge, cultural practices and traditions of the minorities living there, as observed in Barcelona (Ajuntament de Barcelona, 2020e).

A further illustration of place-based planning occurred in the racially and culturally diverse neighborhoods of the Nørrebro district in Copenhagen, where a new park and cycle routes were developed between 2009 and 2012 using public furniture, landscaping, and art objects imported and replicated to represent the several cultures with which residents identified, including palm trees from China, basketball hoops from Somalia, and a fountain from Morocco (BCNUEJ, 2018). The project was driven to foster intercultural tolerance and social cohesion in Nørrebro, responding to the social unrest and divisions that emerged after the 2008 publication of the 'Mohammed cartoon.' Through newspapers, radio, and online ads, residents had the opportunity to propose physical representations of their cultural belonging, which eventually included 108 objects spread across the park and representing 60 nationalities (Rutt, 2022). While this effort shows commendable procedural and recognitional approaches to urban design, by turning Nørrebro in what is colloquially called "Copenhagen coolest neighborhood", the project raises concerns related to distributional justice in public spaces, including issues of gentrification, hipsterization and genderization. In fact, a study of gendered aesthetic experience of Nørrebro park revealed that women's experience of the area was mostly associated with evocative properties of discomfort, unsafety, and fear (Ottolini, 2016).

4.5. Promote cross-identity and -vulnerability climate action and community resilience building

Ultimately, intersectionality is inextricably linked to an analysis of power relations and structures of subordination (Johnson et al., 2020), encouraging community responses to social injustices, and enhancing activism (Collins and Bilge, 2020). Thus, the fifth component of the intersectional climate justice frame is the promotion of cross-identity and cross-vulnerability forms of activism and the strengthening of community-driven resilience. The promotion of cross-identity and cross-vulnerability climate action is timely and necessary to combat siloed forms of activism (e.g., environmentalism, LGBTQI+ rights, #Black Lives Matter, #MeToo), recognizing that they are all part of a struggle for social justice within planetary boundaries (Di Chiro, 2008; Terry, 2009). Hence, we propose that climate action and activism expand from siloed movements to intersectional efforts for climate justice, striving for environmental sustainability while standing in solidarity with and supporting resilience-building of women, BIPOC, LGBTQI+, (dis)ability, and other minority communities. We hereby understand resilience as a flexible concept, which is adjusted to address local contexts (Woodruff et al., 2021), and build on Meerow et al.'s (2016) definition of resilience as communities' ability "to maintain or rapidly return to desired functions in the face of disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity" (p.39). Thus, this subcomponent focuses particularly on offering mechanisms of mobilization and intervention to build long-term empowerment and adaptive capacity for marginalized populations to address vulnerabilities across different social identities. One such mechanism, for instance, is the notion of urban climate experiments, which imply "purposive interventions" that aim to achieve resilient cities, offering spaces of community-focused experimentation in which to innovate, learn and gain experience in climate governance (Bulkeley et al., 2014; Caprotti and Cowley, 2017). To avoid being bound by space and time – and hence non-replicable – this subcomponent argues that an intersectionality lens calls for a model of urban and climate experiments that fosters communities' ownership over their co-owned assets and co-constructed spaces.

In the case of communities which are particularly vulnerable to climate change (e.g., urban poor, residents of informal settlements, displaced persons), this subcomponent calls for community empowerment through insurgent planning to reshape power dynamics of decision-making while reducing climate risks (Fox et al., 2021). With that, it encourages a model of citizenship from below, in which practices of urbanism extend beyond "invitations" to participate, towards "invented" spaces of citizenship, where residents innovate to create their own opportunities and terms of engagement (Cornwall, 2002). This is important, as even when urban adaptation includes participatory processes, cities still struggle with tokenistic civil society engagement in adaptation planning, implementation, and evaluation (Chu et al., 2019). To counter this trend, cities must support the representation of minority-focused organizations and social movements, empowering local communities to manage their resources and take charge of the direction of change (Olazabal et al., 2021). For that to happen, it is vital to improve the delivery of climate data to local populations, enabling regional planning entities to facilitate the exchange of information and knowledge brokerage. Here, it is also worth mentioning the power of social media and online resource hubs for advancing intersectional thinking in climate activism and environmental movements (e.g., Intersectional Environmentalism, 2021). This subcomponent also includes advancing joint work between local governments and not-for-profit or cooperative enterprises, offering ways beyond the state versus (for-profit) market dichotomy (Hinton and Maclurcan, 2017). This goal is also about engaging local organizations in the training and hiring of residents and in developing their own adaptation projects from within the neighborhood and community, thus promoting the creation of new skills, jobs, businesses, and interpersonal relationships, and achieving community-driven development and adaptation.

Barcelona's city council has a strong focus on promoting citizen action in environmental projects through supporting initiatives undertaken by local organizations and the general public. An emblematic initiative around climate resilience is the municipal program "Pla BUITS" (loosely translated from Catalan as "Vacant Lots Plan"), in which the city council revitalizes disused land such as empty lots or wastelands for temporary use (over a period of three years) by public or private non-profit entities. Since 2012, these various entities – formed mostly by neighborhood associations and cooperatives – have transformed the vacant lots into community spaces,

creating urban gardens of various types (including permaculture, organic vegetables, medicinal herbs) as well as implemented projects focused on bioconstruction, rainwater collection and environmental education. Another initiative is the municipal support of green roofs as therapeutic tools for people with intellectual and physical disabilities, unemployed, youth and older people, which also help build social cohesion and community identity. The Horts al Terrat green roof projects are led by local nonprofit entities and social enterprises that support the conversion of unused municipal rooftops into gardens (Ajuntament de Barcelona, 2021a, 2021b). These projects have shown significant benefits for people with disabilities and mental health disorders as they enhance physical and emotional wellbeing, social inclusion, sense of purpose, interpersonal relations, and general improved quality of life. Decisions are taken by the gardeners themselves which allow them to build a much greater sense of autonomy and freedom than in the traditional institutional settings in which they live (Triguero-Mas et al., 2020).

A similar project worth mentioning is the 2021 winner of the World Resources Institute and Ross Center Prize for Cities Award, the program "Sustainable Food Production for a Resilient Rosario" in Argentina Prize for Cities | World Resources Institute, 2021). This flagship urban and peri-urban agriculture program was designed to repurpose under-utilized public and private land to improve food security and nutrition for low-income residents and strengthen resilience to floods and extreme heat. Through the program, more than 2400 families were able to produce their own sustainable vegetable gardens, providing healthy local produce, and thus reducing carbon emissions via more compact food supply chains. The spaces also offer a variety of social programs around sustainability and environmental education, contributing to community's cohesion and place-making Sustainable Food Production for a Resilient Rosario, 2021).

5. Conclusion

As cities face an unprecedented climate emergency compounded by other social and health crises, we argue that there is a growing need for scholars and practitioners to bring forth a conceptual pivot to intersectionality in urban climate adaptation, laying the groundwork for connecting planning theory with justice-led action on the ground. At present, adaptation strategies that aspire to be just and equitable remain theoretically fragmented, normatively scattered, and often not fully engaged with emerging socially transformative priorities on the ground. In this article, we subsumed these disparate adaptation strategies within the critical theoretical umbrella of intersectional climate justice, offering a normative frame to house these fractured literatures in one space and guide them towards justice.

We proposed a fivefold framework to operationalize intersectional thinking in urban climate adaptation (see Table 1). The first component highlights the need for adaptation scholarship and practice to challenge historical economic reinforcers of racial and gender inequities, recognizing and transforming the oppressive systems and structures that have devalued female and nonwhite bodies throughout history. The second component describes the importance of identifying and redressing the drivers of differential vulnerabilities, taking into account the compounding effects of climate impacts, social crises, neoliberal urban development models and, most recently, the Covid-19 pandemic health and social crisis, in the (re)production of social and environmental injustices. The third component speaks to the need to take ethics and politics of care seriously, valuing care as a form of labor essential to social reproduction and putting in place the necessary systems for care to be given and received fairly. The fourth component calls attention to the importance of adopting planning analytical frames and practical approaches that are centered on local communities and their relationship with the characteristics and meaning of places. This entails fostering decolonial approaches to planning and recognizing traditional, situated, and local knowledge arising from diverse and often invisible experiences of place and space. Finally, the fifth component underlines the identification, recognition, and promotion of boundary-spanning forms of activism that support the participation and representation of minority-focused organizations and make local communities more resilient and empowered to take charge of the direction of change. In short, intersectional climate justice accounts for power differentials in order to ensure that the everyday lives of all, not just those with resources and recognition, are safe, secure, and fulfilling.

While conceptually novel, our study requires some potential methodological caveats. Narrative reviews might have limitations when compared with other research designs, attributed to a general lack of systematic, reproducible approaches, which could be vulnerable to bias (Green et al., 2006). To address that limitation, we reveal the number and source of articles reviewed, as well as the inclusion and exclusion criteria adopted. That said, it is worth reiterating that the purpose of this narrative review was not to provide a systematic review of all literature available on core topics. Rather, our aim was to provide a state-of-the-art overview of the main debates in the field and inform a conceptual framework for intersectional climate justice, which we then further illustrate with notable examples from Barcelona. Further research would benefit from a systematic review of historical inequalities in planning for climate justice, and a systematized catalogue of global examples of cities piloting innovating approaches to achieve intersectional climate justice. Further directions for future research include a deeper understanding of the intersecting experiences and needs of disenfranchised urban residents in the context of climate change; the role of social movements in realizing intersectional climate justice in cities; and the policy implications of planning for intersectional climate justice. Specifically, we call for new scholarship on the following questions: (1) To what extent do adaptation projects and policies challenge historical reinforcers of racial and gender inequalities? (2) How do municipalities ensure that vulnerable populations have a right to the "resilient city", including fair and secure housing and access to green resilient amenities? (3) What policies, regulations, and financial tools must cities put in place to value and democratize care work, including self-care and caring for the planet under a changing climate? (4) In which ways do place-based approaches help decolonize climate adaptation, so that traditionally silenced voices are heard? (5) How can governments support civil society action that advances intersectional climate justice?

Through exploring concrete practices from the emblematic case of Barcelona, we identified recent policies, programs, and projects that attempt to consider the five components of our proposed intersectional climate justice framework. These examples do not exhibit

deliberate coordination around the notion of climate justice, as exemplified by approaches that focus on single axes of inequality and offer partial responses to the multiple drivers of vulnerability. Despite that, the illustrations from Barcelona point to evidence of innovative plans and policies that can bring about transformative change in climate action and respond to the climate emergency that Barcelona declared in January 2020 (Ajuntament de Barcelona, 2020a). We have also brought in further brief examples of cities that illustrate progress towards intersectional climate justice.

In sum, by pivoting to intersectional thinking, once fragmented principles, policies, and strategies can become more cognizant of addressing the other subcomponents of climate justice thus enabling more integrated and socially transformative adaptation approaches. Intersectional climate justice might be an elusive and negotiated process; yet it is necessary to truly examine, question and redress the oppressive systems and structures that reinforce social and environmental injustices. This framework highlights a pathway for those seeking to develop and operationalize this vision, thus setting off larger implications for how we think about urban climate adaptation and development.

Declaration of Competing Interest

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

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.uclim.2021.101053.

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