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Community-Led Climate Preparedness and Resilience in Boston: New Evidence from Communities of Color

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Abstract: Communities of color have been historically excluded and marginalized in the ongoing conversations about climate preparedness and resilience at local, national, and global levels. Using focus groups composed of Boston communities of color (Asian American, Black, Latino, and Native American), this study aimed to understand their perspectives on climate change, providing in-depth knowledge of its impact and their views on preparedness and resilience. Research shows that these communities have long been concerned about climate change and emphasize the urgent need to improve climate preparedness. A multi-pronged approach is crucial: listening to communities of color to leverage local knowledge and leadership, engaging in community organizing, advocating for policy change, redirecting attention to institutional resources, and addressing systemic inequalities that exacerbate vulnerabilities. The findings of this study highlight the need for policy changes driven by collaboration and collective action, which can benefit those most negatively impacted by climate change and the lack of preparedness and resilience in Boston and beyond.

Keywords: climate preparedness; climate resilience; communities of color; Boston; climate resilience policy



Citation: Rivera-Kientz, K.; Negrón, R.; Estrada-Martínez, L.M.; Brown, N.H.; Ozor Commer, C.; Admankar, M.; Lillquist, J.; Johnson, N.; Inegbedion, R.; Watanabe, P. Community-Led Climate Preparedness and Resilience in Boston: New Evidence from Communities of Color. *Climate* **2024**, *12*, 149. <https://doi.org/10.3390/cli12090149>

Received: 13 July 2024

Revised: 9 September 2024

Accepted: 19 September 2024

Published: 22 September 2024



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1. Introduction

A growing body of research finds that climate change places a disproportionate burden on communities of color in the United States, many of which are Environmental Justice Communities [1–7]. Environmental Justice Communities (EJC) describe communities facing environmental dangers that threaten the health and safety of their residents. EJCs are predominantly Communities of Color and other communities experiencing poverty that are disproportionately burdened with environmental harms, significantly reducing the quality of life [8]. Underdeveloped communities in the Global North, similar to those in the Global South, face racial and class exploitation, making them more vulnerable to climate change than their wealthy counterparts. This inequality is further troubling because people with fewer resources contribute less to greenhouse gas emissions than wealthy individuals [9].

Despite this evidence, essential discussions on climate change, such as how it is experienced, which policy solutions are most critical, and how we can prepare for and adapt to its impacts, often leave out the voices of the most affected communities [10–20]. The lack of sufficient input from frontline communities regarding climate preparedness leads to misaligned strategies that do not address the specific needs and priorities of these populations [5,10]. For instance, in Massachusetts, various statewide surveys have gathered information on residents' attitudes and beliefs about climate change. However,

few studies have included the views of a large sample of residents of color. As a result, many policy debates are taking place, and decisions are being made without adequate data that considers the opinions of large and critically important population segments. This deficiency is particularly striking in urban areas, such as Greater Boston, where people of color are a large and growing portion of the population. As a coastal urban center with a history of landfilling, Boston is particularly vulnerable to severe weather conditions associated with climate change, including sea-level rise, extreme temperatures, flooding, and droughts [21]. In addition, Boston's geographic expansion using landfills makes it especially vulnerable to sea-level rise and flooding [22,23].

To address this problem, in 2020, the Sustainable Solutions Lab at the University of Massachusetts Boston (with support from the Hyams and Barr Foundations and MassINC Polling) administered a survey to 964 metro Boston residents of color [24]. Beyond reasons of institutional mission and feasibility, we found Boston to be an appropriate case study for two reasons. First, as described above, Boston is particularly vulnerable to climate change due to its physical features and geography. This has meant that Boston has already instituted several plans and policy interventions to build climate resilience [25–27]. Still, many of its residents are unaware of how climate resilience plans have been developed and the impacts of these plans. Second, a focus on Boston is particularly relevant because as of 2024, 56% of the city's population consists of residents of color [28]. Despite the majority of its population being BIPOC, Boston continues to struggle with a history of racial exclusion, particularly against Black and other minority communities. This issue was notably highlighted in the Boston Globe's 2018 Spotlight series titled "Boston, Racism, Image, Reality". This legacy remains significant today, especially as we consider the impacts of climate change on these communities [29].

The initial survey explored perceptions of climate change, its causes, and consequences. This survey, the first to focus specifically on the climate change views of Boston area residents of color, revealed concerns about health, climate change preparedness, and the role of individuals and institutions in adapting to climate change. The focus groups analyzed in this study were informed by a targeted oversample of 964 Boston area residents of color conducted in 2020. This survey provided critical insights into the perceptions and concerns of Asian American, Black, Latino, and Native American communities regarding climate change, which guided the focus group discussions. Specifically, the survey revealed significant concerns about health impacts, climate preparedness, and the role of institutions in addressing climate change. These findings were crucial in shaping the focus group topics, ensuring that the discussions were relevant to the participants' lived experiences and aligned with the broader concerns identified in the survey [24].

To contextualize our findings, we first review key trends related to the perceptions and experiences of people of color regarding climate change. Given the importance of governmental and other institutional actions in fostering climate preparedness and adaptation in EJC's, we briefly discuss how past and current environmental injustices lead communities of color to distrust elite actors and institutions. In light of this, there is a long history of community activism in EJC's to mobilize community knowledge and social capital to mitigate environmental harm. Our findings suggest that Black, Latino, Asian American, and Native American communities in metro Boston recognize the need to combine grassroots action in communities with advocacy for policy attention and institutional resources to prepare EJC's for climate change. We discuss the implications of our findings for Boston and beyond.

2. Background and Context

2.1. Climate Change Perceptions, Awareness, and Experiences among People of Color

The existing body of literature consistently shows that racial and ethnic minority groups in the United States have higher levels of concern regarding climate change, perceive more significant associated risks, and demonstrate more robust support for climate policies compared to their White counterparts [30,31]. While most Americans believe in the reality

of climate change, beliefs vary across racial groups [30,31]. Latinos and Blacks are more likely to consider climate change a significant issue compared to Whites [32]. According to Leiserowitz et al. [33], approximately 70% of Americans acknowledge global warming, with a substantial portion attributing its existence to human activity. Later reports echo this trend, with people of color consistently displaying higher levels of concern and awareness [34] and expressing emotional responses like fear and worry [35–37].

These trends likely reflect more significant exposure to climate change hazards in communities of color. According to a 2021 Environmental Protection Agency report [38], Black people are more likely to reside in areas with the highest projected increase in extreme temperature-related deaths and childhood asthma diagnoses. Similarly, Latinos face notable health risks due to their overrepresentation in outdoor labor sectors, which are more susceptible to extreme heat [39–41]. Asian Americans are more likely than other groups to live in coastal areas and are at risk of displacement due to climate-driven high-tide flooding, which also results in increased traffic delays [39–41]. Native American communities are confronting significant risks from climate impacts, including coastal erosion and reduced precipitation, threatening their cultural heritage and ability to stay in their ancestral homelands [40–42].

Thus, climate change is compounding historical and ongoing environmental injustices that contribute to an increased sense of urgency and personal threats from climate change among people of color [39]. For example, Blacks and Latinos are more inclined to believe that climate change will have individual- and community-level detrimental effects [37,39]. This stronger perception of greater risks also translates into more significant support for climate action among people of color compared to Whites [37,43]. Climate action may be advocacy for climate change mitigation policies or community organizing and activism. Regardless of the pathways for action, EJC's must contend with government officials and gatekeepers, navigate bureaucracies, and mobilize to receive institutional attention to local needs.

2.2. Environmental Injustice, Institutional Distrust, and Community Action

The disproportionate climate vulnerability of urban neighborhoods of color can be traced to systematic racial segregation policies such as redlining, which between 1930 and 1968 denied mortgages and financial services to residents of specific areas based on racial and ethnic composition [44]. The impacts of racial residential segregation continue to shape the environment and health of communities of color. For example, formerly redlined areas have fewer tree canopies [45], higher levels of intra-urban heat [46], and significantly higher rates of emergency department visits due to asthma [47]. Due to historical and ongoing neglect and exploitation, communities of color have developed a deep distrust of elite institutions such as state and local environmental agencies [48,49], corporations, and military organizations [49].

The Flint Water Crisis, which began in April 2014, exemplifies sources of distrust. The state-appointed emergency manager's decision to switch Flint, MI's water source, to the untreated Flint River from the treated Lake Huron and Detroit River for financial reasons resulted in severe public health consequences. This economic decision, made by an outsider, led to long-term lead poisoning in 6000 to 12,000 children, ongoing mental and physical health issues, a Legionnaires' disease outbreak killing 12 and affecting almost 90 others, and an increased risk of Alzheimer's disease [48–53]. Flint residents, the true experts of their community, were disregarded, leading to a deep erosion of trust and highlighting of environmental racism. Similarly, the Dakota Access Pipeline (DAPL) project disregarded the interests of Tribal nations, prioritizing financial gains for Dakota Access, LLC., Houston, TX, USA, and the U.S. Army Corps of Engineers over Indigenous rights and environmental protection [54]. The DAPL protests at Standing Rock underscored how decisions benefiting elite organizations often exclude Indigenous voices and fail to prioritize the public good [54]. The Flint water crisis and DAPL cases, beyond examples

of environmental injustices, serve as cautionary tales of the profound consequences of excluding community voices in climate governance and decision-making processes.

In addition, urban renewal and urban greening projects that make way for privatization and prioritize individual property rights have made it harder for EJC communities to safeguard themselves and each other from harmful conditions [55,56]. Such projects have made way for EJCs gentrification, laying the groundwork for skepticism about climate adaptation projects, such as floodable parks and seawalls, and their potential for further gentrification [57,58]. The case of East Boston, a low-income, majority-Latino migrant community, is an example of how an already vulnerable population faces sociocultural and physical exclusion by climate adaptation planning processes [58,59]. The hyper-focus on individualism in adaptation projects favors wealthier residents who can afford climate-proofed new constructions. For example, flood insurance policies often exacerbate economic and social vulnerabilities by prioritizing individual property rights over community resilience, leading to inequitable distribution of resources and increased financial burden on communities with high concentrations of low-income and BIPOC residents [60,61]. Federal buyout programs also engage in racial exclusionary practices where whiter neighborhoods and counties are targeted, benefiting more from these funds [62]. While a few privileged benefit from their resources, EJCs face challenges related to who can make decisions about the allocation of resources, who should have access to climate-resilient land, and who should make decisions about land use and development [55].

An example of two local EJCs that have not only wrestled with these questions but have taken collective action to create solutions is GreenRoots. Greenroots is a three-decade-old resident-led community organization that originated in response to the disproportionate exposure to environmental hazards in East Boston and Chelsea, Massachusetts. GreenRoots works on EJ issues such as climate resiliency, preparedness, access to green spaces and waterfronts, energy democracy, land sovereignty, health equity, and more, through a base-building and community approach [63]. These and other efforts underscore the importance of community-based climate preparedness efforts informed by the perceptions, experiences, and priorities of those most affected by climate change. Engaging these communities in decision making can lead to more effective and equitable climate resilience strategies. For instance, community-led initiatives in Boston have demonstrated the potential to build resilience through local knowledge and leadership, ensuring that strategies are culturally relevant and are widely supported within the community [14,64].

3. Materials and Methods

Between March and August 2021, we conducted eight Zoom focus groups to examine climate change perspectives among Asian American, Black/African American, Hispanic/Latino, and Native American communities in the Greater Boston area. The research team developed and piloted the moderator guide to examine critical topics from the Views that Matter survey data [24]. Table 1 presents a demographic breakdown of each focus group. The groups had six to ten participants, and a total of 70 residents participated in the focus groups (47 women and 21 men, including one transgender man and two non-binary participants). The greater participation of women in the focus groups may reflect societal expectations and cultural norms that discourage men from participating in research and the gender gap in support of climate action and environmental concerns [19,20].

Table 1. Demographic characteristics of focus group participants.

	Asian American FG1 (<i>n</i> = 10)	Asian American FG2 (<i>n</i> = 10)	Black/African American FG1 (<i>n</i> = 9)	Black/African American FG2 (<i>n</i> = 10)	Hispanic/Latino FG1 (<i>n</i> = 10)	Hispanic/Latino FG2 (<i>n</i> = 7)	Native American FG1 (<i>n</i> = 8)	Native American FG2 (<i>n</i> = 6)	Totals
Language	English	Cantonese	English	English	Spanish	Spanish	English	English	-
Age									
18–29	0	0	3	3	5	3	0	0	14
30–44	7	0	1	0	2	3	0	3	16
45–59	2	1	1	3	3	1	8	2	21
60+	1	9	4	4	0	0	0	1	19
Gender									
Female	3	8	7	5	8	6	7	3	47
Male	6	2	2	5	0	1	1	3	20
Non-Binary	1	0	0	0	1	0	0	0	2
Transgender	0	0	0	0	1	0	0	0	1
Education									
<H.S.	6	0	0	0	0	0	0	0	6
Completed H.S.	3	0	0	0	3	0	0	0	6
Some college	0	0	2	1	2	1	0	0	6
College degree	0	7	0	4	1	2	3	3	20
Advanced degree	0	3	5	5	1	1	5	3	23
Trade school	1	0	0	0	1	0	0	0	2
Prefer not to say	0	0	2	0	2	3	0	0	7
Annual Income									
Below \$25K	0	8	1	1	3	0	0	1	14
\$25–75K	3	2	2	5	0	4	3	3	22
\$75–150K	4	0	3	4	1	0	5	0	17
\$150K+	3	0	1	0	0	0	0	1	5
Prefer not to say	0	0	2	0	6	3	0	1	12

We selected the four racial and ethnic groups to correspond with the constituents of the four ethnic research institutes at the University of Massachusetts Boston. The team partnered with the Institute for Asian American Studies, the Mauricio Gastón Institute for Latino Community Development and Public Policy, the Institute for New England Native American Studies, and the William Monroe Trotter Institute for the Study of Black Culture to recruit participants for the focus groups and, in most cases, moderate as well. These institutes are well-known for their strong community ties. In partnership with community-based organizations, the institutes recruited participants from each of the respective racial and ethnic groups using convenience and non-probability sampling methods. The group moderators shared the same ethnic/racial backgrounds as the participants. Most focus groups were conducted in English, except for two in Spanish with Latinos, and one in Cantonese with Chinese Americans.

The focus groups were recorded using a voice recorder, translated into English when required, and transcribed. The first author translated the Spanish transcripts, while staff from the community organization translated the Cantonese transcript. Pseudonyms identify respondents. We analyzed the focus group data following a systematic inductive approach to qualitative data, including data reduction, pattern identification, and framework development. We conducted two rounds of line-by-line open coding, guided by the initial topics of the moderator guide and other topics as they emerged. Two rounds of focused coding were conducted by the first author and one by a research assistant to enhance internal validity. Our analysis identified salient themes within groups (e.g., Asian Americans) and common themes across groups. Below, we summarize the key themes regarding climate preparedness for each group. We then explore overarching themes across all groups, specifically related to individual, collective, and government responsibility for addressing climate change and its impacts.

4. Results

4.1. Climate Resilience and Preparedness Views by Group

Climate resilience and preparedness for short- and long-term climate change events are of great concern to metro Boston residents. Approximately half of the survey respondents in our team's first study reported taking specific actions to prepare for extreme weather [24]. However, less than 15% felt that their regions, neighborhoods, and families were "very prepared", and less than 42% felt "somewhat prepared" to withstand a significant climate change-related extreme weather event. In addition, they indicate a significant disparity in the level of preparedness between low-income and affluent areas.

The focus group discussions generally confirmed the residents' concerns with their own and their communities' level of preparedness for extreme emergencies. In addition, they emphasized the need for collective action of various forms to address climate change. The response of one Native American woman nicely summarizes the common sentiments and concerns expressed by residents of color in our study:

If there were something catastrophic, is the town prepared? No way, and that's why I feel like there's a certain responsibility that my household has to take around. I do believe there are disparities in terms of communities that are more prepared than others, and a lot of that I think, has to do with financial resources (Frances, Native, W).

The responses to our survey of more than 900 metro Boston residents indicated that the levels of preparation were an area in which some notable differences were displayed based on race. We further explored these distinctions in the focus group discussions.

4.1.1. Asian Americans

Many Asian American residents felt unprepared and were highly concerned about their ability to secure food, water, and other essential materials for extreme weather events. They attributed this lack of preparation to financial constraints, space to store things, and the feeling that their homes needed monetary value. The Chinese-American group, in particular, discussed the need for emergency preparedness, with members emphasizing

that they had no extra food, water, or medications in their homes. Chelsea, a Chinese American woman, explained, “I don’t stock up on anything; I usually buy only when I need them”. While another stated, “I don’t have any assets in my house, so I don’t buy home insurance” (Cami, Asian, W).

At the same time, they noted a unique lack of emergency preparedness in Boston’s Chinatown compared to other parts of the city. Cece, an Asian American woman, attributed this to the concentration of commercial business in Chinatown, stating, “No, how can we be prepared, especially those living in Chinatown? Shopping is so convenient; there is no reason to buy more things to stock up because shopping is so convenient”. This sentiment was tied to concerns about wasting resources. For example, residents pointed out that the unpredictability of severe climate events carried the risk of having to throw away food stored for too long in emergencies.

Such sentiments showed a certain practicality among Asian American focus group residents. For example, they pointed to the physical constraints of stockpiling and storing food and other items in Chinatown’s small apartments. They also reflected the fundamental but perhaps false and dangerous notion that food and other retailers would remain accessible during crises and normal times. An unfortunate finding was that the lack of preparation might be accompanied by a false sense that an emergency could be addressed by ready access to food and supplies from stores and suppliers, which might also be adversely affected by a climate event.

4.1.2. Black Americans

Black Americans emphasized the importance of the community and collective good in their opinions on combating climate change. For example, a Black woman noted the following:

I think we are going to have to come together as a collective and come up with solutions whether they are small like recycling, using less water, just small things, as well as big things like oil, which kind of goes back to the point of financial benefits, but as a whole collective being able to incentivize and I guess it does not have to be for financial benefit if it’s us as a collective, the incentive should be that if we don’t have a planet, we can’t live. This is really what we have. (Blake, Black, M).

The role of structural inequalities in environmental health and justice was central to the discussion among Black Americans. Black residents attributed their distrust of government action to the painful histories of racist policies that contributed to environmental injustices, such as lead in drinking water in Black neighborhoods. As one Black man stated:

It pisses me off. I worry that it’s a deliberate way to minimize. I mean, so I think it’s a justice issue. . . We live in neighborhoods where they were dumping all kinds of chemicals all over in certain neighborhoods, and Hyde Park is one of them. . . and there are parts of Roxbury that were dumping grounds for the town. (Oscar, Black, M).

They also noted the need for continuous financial investment they must provide to protect themselves from extreme weather events. Leah, quoted earlier, shared: “It’s not going to get better because each summer gets hotter and hotter. As I said, I don’t know how long the air conditioning is going to last, but I’m spending my last dollar on it”.

In summary, many Black residents described disinvestment as driven by racism, which impacts the community’s relative lack of readiness and frustration related to their community’s climate change preparedness. Residents identified a connection between racism, wealth disparities, and disinvestment, exacerbating their vulnerability to various physical, social, and economic problems.

4.1.3. Hispanics/Latinos

Latinos felt the need to be highly prepared for any eventuality. They acknowledged their experience of the COVID-19 pandemic in driving these decisions. For example, a Latina stated:

I was going to say that we do a little bit... I have candles, a small battery light, and flashlights in case we lose electricity. As do things like this, so you are prepared in case anything happens. I also have a bag with stuff like a first aid kit, water, a couple of cans, but it's very basic. . . About the pandemic, now we learned you have to prepare for the worst. (Cecilia, Latina, W).

Several Latino residents referred to their countries of origin to explain the differences between themselves and U.S.-born people and their understanding of risk. Griff positively compared climate preparedness in the U.S. to that in her country of origin, particularly regarding health impacts:

This is a country with a well-developed health system. I wouldn't worry about that part. . . where I come from it's totally different, so I would worry [there]. But as long as I'm here, I think they are going to deal with it very well. (Griff, Latina, W).

However, one resident noted at least one surprising way in which she was unprepared for Boston, given what she was used to in her home country:

I arrived on June 6th [to Boston]. The [weather] was already warm. . . And I got around with my sandals from Santo Domingo, you know, as we're used to dress there. I grabbed my sandals, put them on and went to work. Look, when I got to work, I had these water blisters, this size, because the heat here is stronger than Santo Domingo. But I didn't know that, then. Well, in the summer, I never wear sandals, now I only wear sneakers. (Gabby, Latina, W).

The observations of Latino residents gave a sense of how, for many, the notion of community and their frames of reference extended beyond the confines of their homes in the Boston area. As a diasporic group that often maintains close relationships with countries beyond the United States, Latino residents frequently referenced climate-related events that happened in those countries as indicators of what might happen in the U.S.

4.1.4. Native Americans

Discussions in Native American focus groups noted a general sense of preparedness, the importance of social relationships and safety nets, community-level goals in emergency preparedness, and inequity in communities' ability to prepare for climate change. Social relationships were vital to accessing real needs like food and water. As a Native American woman stated:

Really investing and building up some of my personal relationships with people close to me are going to make all the difference in the world. Because I mean, who knows what the next nightmare is going to be? It's hard to gauge what the issues are going to be that we face. So, I think for this last one, that was really kind of my take-home message on preparedness. (Nadya, Native, W).

Native Americans also noted that having extended family in the proximate area was instrumental in cases of emergencies. A Native American man stated:

Let's see, we had extreme freezing one winter, and that froze some of our pipes, and that was an issue, but again, having family close by, the impact was minimized because of it. We could just go to another family member's home. (Mike, Native, M).

A distinct point of view that emerged from these focus group discussions was the centrality of the community in its efforts to adapt to and mitigate the effects of climate change and other emergencies. For example, Nia, a Native American woman, remarked, "In our tribe, we're talking about how to prepare for many pandemics because things haven't gotten better with the environment. And so, this is more of a pattern of how our lifecycle is going to be". Nia further noted the importance of being part of an established system: "I got more networked with Native systems than I did before when relying on Western systems. And I also recognize that I got that wonderful Native American lifeline

kit". At the same time, Nia saw structural inequalities and, specifically, environmental racism as the root cause of inequities in preparedness for different communities.

Overall, Native American residents' comments reflected themes prevalent in other focus groups: the historical patterns of disinvestment and underinvestment, the impacts of systemic racism resulting in fewer resources for individuals and groups to combat and prepare for climate change, and the reliance on community responses and close personal relationships to weather the storms despite poverty and neglect. Next, we elaborate on these common overarching themes that emerged across the four ethnic and racial groups.

4.2. Addressing Climate Change: Individuals, Groups, and Government

In this section, we follow the previous discussion on the disparate capabilities of various groups and communities to prepare for the impact of climate-related occurrences by discussing how individuals, groups, and communities envision responding to the threats of climate change. Here, the debate focuses primarily on the responsibility for addressing climate change and on the government's promotion of policies that may prevent or mitigate harmful impacts on health, safety, and the environment.

4.2.1. Institutional Failure and Personal Responsibility

Virtually all focus group participants expressed a genuine desire and need to do what was necessary and possible as individuals to recognize and tackle the challenges of climate change. For these residents of color, many of whom were immigrants, their painful personal experiences with humanitarian disasters or systemic injustice shaped their sense of what was needed for climate preparedness, and notably, their sense of agency. Residents cited institutional failures in their discussions on their personal responsibility for preparedness. For example, reflecting on her mother's surviving a catastrophic flood in her country of origin, Alba recounted,

Twenty-five years ago in my country, there was a river overflow. The sea withdrew and caused a river overflow with a strong current. . . It wiped out an entire sector, and neither the authorities, the Red Cross, nor anyone was prepared for a situation like this with so many deaths". Although the local government's total lack of preparedness warranted caution in over-reliance on institutions, she underscored the need for architectural solutions that enable escape and survival in such emergencies. (Alba, Latina, W).

Along these lines, Barbara and Liam, both Black residents, expressed skepticism towards governmental intervention, suggesting that empowerment and change must originate within communities. Notably, in their appeals for personal agency and skepticism of government action, these Black residents cited the history of racism against Blacks in the U.S. and the present manifestations of systemic racism. Barbara stated, "Because we have always pulled ourselves out of tough situations, right? Not all the time were we given the resources to succeed, and this is no different". Liam, a Black resident, extends this critique of government institutions, questioning the likelihood of equitable government action to broaden access to climate resilience technologies, such as solar panels, citing elites' prioritization of profit over the public good. He notes,

The government doesn't want us to get more money. They want to keep their citizens working assets. . . I don't understand where the action is going to come from, unless it's, like I said, financial, they're going to implement solar energy and whatever they do, but you're going to have to pay for it". He added that access to such resources would be first given to upper- and middle-class residents. (Liam, Black, M).

Another Black resident, Oscar, aligned with Barbara and Liam. He emphasized the power of collective grassroots action over reliance on governmental change. As he said, "I think that it's up to individual people to do their part and to change where you can. I think it's an ongoing and important thing, but I'm not waiting on the government because I know that if we wait on them, then I'll be back on a plantation in Georgia picking cotton". Thus, he argued that significant social change must be driven by the people, particularly those from

marginalized communities, who should not wait for government initiatives but instead demand accountability from elected officials and take personal responsibility. Liam's sentiment echoed Barbara's appeal to personal agency, noting the need for community members to prioritize essential areas, such as nutrition and education, over non-essential material goods. Several residents saw community education as key to preparedness for climate change and to assume responsibility for climate action. For example, Bea shared, "As a retired teacher and educator, the day after the election of 2016, I said we've got to put civics education back in schools. First of all, not only does it help you to learn about how your government works, but it also makes you a part of how that government should work and know that you have access". (Bea, Black, W)

However, Lane, another Black resident, offered a rejoinder citing the limits of education and without the commitment of people with decision-making power or elites like "Jeff Bezos" with massive wealth to invest:

We need to teach people more about climate change and global warming and blah, blah, blah. But at the end of the day, I think we're all old enough to know how to be green eco citizens. . . I'm trying to say that you can educate people all you want. I'm sure the government will make efforts to educate people more or make more green solutions accessible. . . We can help and make people in the community aware, but at the end of the day, I think as some of the other people were saying it depends on the politics and the demographics because you need the people up top to really make decisions. (Lane, Black, M).

Lane's comment underscored the tensions residents saw between people's power and institutional power, but in particular, there was persistent skepticism of institutional commitment to the public good. Residents expressed this skepticism in discussions across multiple focus groups, citing lies by leaders at the highest levels of government and corporations, whom some residents saw as complicit in promoting lies about climate change. Leah, a Black resident, pointed out, "Many of our major corporations were well aware that they were harming the environment when they were doing the things they were doing and continue to do them. The government is just as much, if not more so, responsible for the global warming that has gone on. . . The country has got to stop lying about this if we [are to] survive it. . ." Imani, an Asian American resident, linked neglect and misinformation by those with institutional power to be connected to systemic racism, which she saw as the fundamental issue "to combat to really be able to address some of these disparities and issues that we're facing. . ."

While many residents presented their answers to questions about climate change and how to address its impacts of climate change in terms of a more significant critique of how inequities (particularly wealth inequities) defined and often limited their ability to respond and prepare, many of these residents generally did not seem paralyzed by the weight of these economic limitations. They saw a need for themselves as individuals and communities to take the initiative and lead in addressing the challenges of climate change. In other words, residents of color, many of whom face economic challenges, did not use their difficult circumstances as excuses for inaction.

4.2.2. The Case for Government Leadership

Residents consistently connected their calls for personal action to collective efforts. In this regard, participants across focus groups viewed community engagement as a fundamental catalyst for change. Indeed, residents' community collaboration was seen as a driver of broader policy changes and a way to ensure government accountability. As Lily, a Black resident, said, ". . . it is top-down and bottom-up". Therefore, while residents expressed skepticism about institutional accountability for effective climate action, they tended to agree that climate resilience efforts require synergistic engagement between government authorities and the communities they serve. Along these lines, Mike, quoted earlier, expressed that,

There's only so much that individual consumers can do that is really influencing climate change. It really has to be federal, state, and local communities coming together to say these are the actions that are going to take place and kind of help guide our planet to have a healthy future. (Mike, Native, M).

Mike went on to explain that state-level action can influence federal policy, "...I would really advocate that if you can change it here first in Massachusetts, then it just makes it easier for somebody on the national level to say, look, here's one state who's making this sort of change". Andres, a Latino resident, saw such synergistic engagement between residents and officials driven by direct community action. As he put it, "...you have to start with the city councilors, the city council, the governor we have, or the governor or mayor...Because they are the ones you have the most. . .I believe that the more we knock on their office doors and the more calls we make, the more changes they can make if they see many people focused on making this change".

Indeed, residents did not dismiss the role of government outright. Residents agreed that responses to climate change required decisive and informed action from the government at all levels. They saw a particular role of the government in three areas: infrastructure, economic development, and education. First, residents emphasized infrastructure improvements and preparedness for climate-induced storms, floods, and heatwaves. Residents called for specific government actions to protect communities, particularly vulnerable ones in coastal areas. Alba, a Latina resident, identified several areas for governmental investment. Areas of investment included infrastructural measures, such as sea walls to prevent flooding in the community, clinics designed to track and respond to the impact of heat waves on residents with chronic conditions, and high-rise building development that followed environmental protection rules to preserve green spaces. Charlie, a Native American resident, agreed with a measured governmental response that emphasized protecting the natural environment. He advocated for planting trees and measures that "protect wetlands and protect waterways. . ."

A second area that residents saw the government playing a central role in was economic development and stability, which they saw as being directly connected to the capacity to respond to climate challenges. They argued that a strong economy is essential for funding and implementing effective climate responses. A statement by Isaac, an Asian American resident, exemplifies this sentiment. He stated, "...economics is number one in my mind. Without economics, you can't do anything. If you have a good economy, local government can have some budget for these, prevention of these disasters. . .to help those people who are vulnerable".

4.3. A United Front and Common Ground

In the end, it is reasonable to conclude, as many residents did, that it is not primarily a question of individuals or the government taking on these issues but rather the primacy of collective efforts to tackle the challenges of climate change. In discussing the impacts of and responses to climate change, the residents of color in our study voiced a call for unity, sustainability, and a profound re-evaluation of our relationship with the environment. The necessity of collective action was central in their perspectives, underscoring that in metro-Boston communities of color, climate change is seen not merely as an environmental issue but as a communal challenge that affects everyone, regardless of background. Leah articulates this sentiment, saying,

If we don't all work together to fight this and to turn it around or even to slow it down, because we can't turn it around entirely, but to give ourselves time to hopefully put it in check somehow, it doesn't make any difference who you are; we are all going to feel the effects of this. (Leah, Black, W).

Another Black resident, Oscar, saw persistent messaging about the threats of climate change as crucial for collective change, stating "I think that we need to continue to do the work. I do think that if we continue to help people understand how directly linked to their

survival, these things are, that there will be change". Ian struck a hopeful note about the role of education in spurring collective action, sharing,

A lot of the people are learning more about it and they do something about it because we cannot go by a day without hearing in the news... I hear about those a lot in comparing to ten years ago. So at least we are doing something about it and going at that direction and the education level. So I actually feel better about now than ten years ago.
(Ian, Asian, M).

For some residents, the theme of unity is inseparable from long-term thinking and sustainability. Many participants, like Mike, stressed the importance of foresight in environmental planning, asking, "What's our community going to look like in 100 years? And how can we use that vision to impact the type of decisions we're going to make today?" Residents saw this forward-looking approach as essential for promoting policies beyond immediate concerns to ensure a sustainable future for future generations. The relationship between people and the environment was frequently referenced, particularly by Native American residents who advocated for viewing the land and environment as part of the community. Kate expressed this perspective: "If they could switch to... treating land and water and our air as our family, that would completely change the way they make policies". Several residents responded to inquiries about climate change with broader environmental concerns. When asked to assess the impact of climate change, residents spoke about its impacts not only on human life but also on human life. The statements by Mike, Ian, Oscar, and Leah underscored a view held by many focus group participants that in addition to structural change, sustainable responses to climate change required cultural shifts encompassing changes in how people understand and relate to the natural world.

Finally, the discussion highlights the importance of inclusivity in addressing climate change. Ivy, an Asian American resident, brings attention to the broader social implications, noting, "If you really want to seek change, you have to be aware and active". Her statement shows that effective climate action requires confronting and integrating broader social issues, including racism and inequality. Indeed, the impact of environmental changes on vulnerable populations is a recurrent concern. Participants argued that the adverse effects of climate change, such as displacement and increased disease risk, disproportionately affected marginalized communities. They also consistently called for a protective approach in policy-making that considers the specific needs and challenges faced by the most vulnerable groups.

5. Discussion

Our findings show the need to improve climate preparedness in communities of color in metro Boston. Considering the broader implications for climate resilience policies, the results of this study highlight the need for policy and decision-making efforts that promote collaboration and collective action. Climate change will affect community interconnections and how resilience strategies contribute to existing and emerging patterns [65,66]. Climate change resilience efforts must recognize and consider societal processes that shape communities as historical and ongoing patterns of unequal growth that can threaten to create new dimensions of insecurity and injustice if local conditions are not addressed [58,60]. Communities should focus on building resilience to protect and support the socio-ecological system's functions in the future while enabling changes in social organization [67]. A major challenge in developing climate resilience strategies is addressing cultural dimensions and fostering individual and community involvement in planning to determine policy goals and implementation methods [68,69]. The City of Boston has made some strides in this direction. The city launched the Climate Ready Boston initiative in 2016 [25]. It now operates under the Office of Climate Resilience, where an equity focus has been increasingly promoted [26,27].

Developing and implementing climate change preparedness and resilience policy require collaborative and complementary actions [66,70]. Stakeholder insight and participation can help to establish the credibility of various strategies, including how approaches

are carried out successfully [71,72]. See and Wilmsen [73] recommend addressing political and social obstacles to participation in the resilience policy development process, working beyond technocratic procedures, and overcoming administrative hurdles to ensure that those affected by climate change interventions are more fully supported. Shokry et al. [56] assert that resilience efforts must look beyond infrastructure and ensure that this work focuses on community building to strengthen social ties and networks. Without attention to the drivers of social vulnerability, including those being exacerbated by climate change, policies are likely to maintain the status quo and result in further exclusionary patterns of development [74]. In this sense, it is necessary to determine how to ensure that communities have agency in the planning process to acknowledge how resilience efforts affect them [75]. The burden of climate actions in the community cannot be left solely to individual residents; government officials and initiatives must account for diverse community perspectives and needs.

Enhancing climate preparedness in communities of color requires concerted efforts to include these communities in policy discussions, leverage local knowledge and leadership, and address systemic inequalities that exacerbate vulnerability. By focusing on these areas, Boston and other cities in the U.S. can develop more inclusive and practical approaches to climate resilience that will benefit all residents. To enhance community-driven climate resilience, policy efforts must prioritize voices from Boston's communities of color in long-term government engagement and action [76]. In particular, all groups in the study emphasized the need for policies that ensure access to essential resources and provide multiple support modes during extreme climate events.

Black residents' concerns about historically embedded racist policies and practices in Boston highlight the need to address structural racism, which will benefit all groups. Closing wealth gaps, for example, will provide communities with the resources necessary to tackle climate crises [77]. Along these lines, the City of Boston, following other cities in the U.S., convened a task force to study the issue of reparations to Black residents and to make recommendations [78]. Discussions with Native American residents further revealed the need to rethink Western, individualistic, human, and market-centered approaches to climate resilience. Integrating traditional ecological knowledge and practices across cultural groups can enhance the sustainability and effectiveness of climate change adaptation. Such a community-led approach acknowledges communities' expertise while fostering community cohesion and empowerment when facing climate challenges [36]. Thus, the climate resilience policy for Boston and beyond calls for deep collaboration and reevaluation of community relationships, including those with the environment.

6. Limitations

Our study had several limitations. First, by comparing perspectives on climate preparedness and resilience across racial and ethnic groups, we did not consider other critical variables, such as gender and class, in our analysis. This limited scope may lead to overly simplistic generalizations, potentially undermining the validity and broad applicability of our findings. Additionally, the use of broad racial and ethnic categorizations, particularly pan-ethnic labels such as Hispanic/Latino and Asian Americans, obscures the significant diversity within these groups, including national subgroups and corresponding cultural differences. With the exception of the Chinese American focus group facilitated in Cantonese, the focus groups asked participants to self-identify with the general categories rather than specific national groups.

This study's reliance on focus groups, which inherently group participants based on shared characteristics, could further emphasize similarities and obscure the specificities of people's experiences. These discussions characteristically do not delve deeply into specific demographic factors that may drive contrasts within the groups, and the differences highlighted, such as access to resources, could inadvertently stigmatize participants in a facilitated setting with strangers. Several steps were taken to mitigate these limitations. We provided a detailed demographic breakdown to contextualize the focus groups

and included extensive excerpts of participants' statements to preserve the nuances of their perspectives. Additionally, we noted areas of convergence across racial and ethnic groups to illustrate the shared experiences of participants that transcend ethnic and racial backgrounds.

While our study underscores the need to enhance climate preparedness in communities of color in metro Boston and offers broader implications for climate resilience policy, these conclusions may not be fully generalizable to other major cities. Boston's notable, though incomplete, progress toward climate resilience may not reflect the situation in other regions. However, as our findings highlight, communities of color in Boston still feel excluded from such efforts. This serves as a critical reminder for cities not to become complacent about equitable climate resilience, even in the face of progress.

7. Conclusions

In summary, our study highlights the urgent need for equitable and inclusive climate resilience strategies, particularly for communities of color in the Boston Area. The findings reveal that communities of color in the Boston Area are not only aware of the disproportionate impacts of climate change but are actively seeking solutions that leverage local knowledge and leadership. The focus group participants emphasized the need for collective action, systemic policy changes, and the inclusion of marginalized voices in decision-making processes. By addressing systemic inequities and fostering collaboration between community members and policymakers, we can develop more effective and equitable climate resilience policies. As climate-related challenges escalate, we must adopt comprehensive strategies that bridge community insights with institutional support to ensure that all residents, especially those most affected, are prepared for future climate events. The lessons learned from Boston's residents of color can inform other major urban centers aiming to achieve climate justice and resilience, ultimately contributing to a more sustainable and equitable future for all.

Author Contributions: Conceptualization, L.M.E.-M., P.W. and R.N.; methodology, L.M.E.-M., P.W. and K.R.-K.; investigation, L.M.E.-M., P.W. and K.R.-K.; analysis, K.R.-K. and R.N.; writing—original draft preparation, all authors; writing—review and editing, all authors; supervision, R.N. and L.M.E.-M.; copyediting—N.H.B. and C.O.C.; funding acquisition, resources, and project administration, R.N., L.M.E.-M. and P.W. All authors have read and agreed to the published version of the manuscript.

Funding: This research was supported with grants from the Hyams Foundation, the Barr Foundation, and a National Science Foundation SBE/SMA Award #2334216.

Institutional Review Board Statement: The protocol was approved by the Institutional Review Board at the University of Massachusetts Boston (Protocol#: 2728-2020033).

Informed Consent Statement: All participants gave their informed consent for inclusion before they participated in the study.

Data Availability Statement: The anonymized data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors report no conflicts of interest.

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