Evaluating the Incorporation of Climate Justice Concerns Within Resilience Plans Across Eleven U.S. Coastal Cities

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ABSTRACT

Building coastal resilience can help communities prepare and adapt to climate change. While the impacts of climate change are not equitably distributed, a method has not been developed to measure how resilience plans address justice. This study developed a Just Resilience Index (JRI) to assess how justice themes were incorporated into resilience plans. The JRI examines how justice frameworks (recognitional, distributive, and procedural justice, community capability) were addressed within the resilience plans of 11 U.S. coastal cities. Justice was considered in 41% of the resilience plan actions. Fifty-two percent of the justice-related actions recognized the needs of low-income communities but only 3% recognized specific racial groups. Of the justice-related actions, 73% addressed distributive justice but procedural justice was least characterized within the plans (46%). The JRI can guide future planning efforts to ensure that justice frameworks are better integrated within resilience planning to reduce inequities from climate-related disasters.

INTRODUCTION

An increase in climate disasters such as Hurricanes Katrina and Ida have led to the development of resilience approaches to ensure that communities can adapt. These emergencies have also demonstrated that disasters disproportionately impact marginalized areas of communities (Adger, 2010; Cutter et al., 2008; Shi et al., 2016; Thomas et al., 2013; Van Zandt et al., 2012). In these socially and environmentally disadvantaged communities, the risks and adversities may cluster together, where loss of one capability may increase the susceptibility to other losses, leading to "corrosive disadvantages" (Wolff & De-Shalit, 2007). The need to assess and address social and economic vulnerability, in addition to environmental factors, in resilience planning and implementation is now universally recognized (United Nations Framework Convention on Climate Change [UNFCCC], 2021). If policies do not address the needs of the most vulnerable populations, climate change would worsen the existing inequalities (Schlosberg & Collins, 2014). Responses to Hurricane Katrina demonstrated how preexisting or systemic injustices deepen patterns of vulnerabilities and disadvantages among marginalized communities (Bullard & Wright, 2009).

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Resilience strategies are intended to minimize the impacts and risks stemming from climate change. Resilience involves building community capacity to withstand, adapt, and transform in positive ways in response to disturbances, risks, and vulnerabilities. Still, how social vulnerabilities are assessed, how the most vulnerable populations are protected, and how issues of power and justice are conceptualized within resilience planning approaches are less known. Strategies aimed at producing just outcomes should examine who benefits and who bears losses, and should direct efforts and resources toward helping those vulnerable to adapt to unforeseeable disruptions (Fainstein, 2014, 2018; Zolli, 2012).

Regardless of this wider recognition to consider social vulnerability within resilience planning, scholars have widely critiqued efforts to build resilience that have tended to prioritize elitist, hierarchical, short-term, unsustainable technocratic approaches (Eriksen et al., 2015; Holland, 2017; Patterson et al., 2018; Pelling, 2011; Pelling et al., 2015). A prior analysis of resilience planning in eight global cities found that the planning process enhanced power imbalances, failed to consider impacts on inequality, primarily protected economically valuable areas, and failed to protect vulnerable areas (Anguelovski et al., 2016). Resilience efforts by the Rockefeller Foundation have similarly been criticized as trying to improve the resilience of downtown and economically powerful areas (Shi, 2020). Similar observations were reported by Puszkin-Chevlin (2007) and Fainstein (2018), noting that interventions can compound patterns of environmental injustice and create new sources of inequity. A discursive disconnect was found between governmental focus on resilience-based approaches and community concerns (Schlosberg et al., 2017). Failure to address vulnerability risks perpetuates patterns of urban and rural spatial inequities and favors those already positioned to succeed (Adger et al., 2006), while putting marginalized populations at further disadvantage (Agyeman, 2013; Anguelovski et al., 2016; Shi et al., 2016). Inequities unaddressed within resilience approaches may also lead to conflicts over their legitimacy, limiting the overall success and sustainability of climate resilience efforts (Adger, 2016; Agyeman, 2013; Schlosberg, 2012; Schlosberg et al., 2017). Pelling (2011) identifies that adaptation as implemented has multiple facets: pathways that favor maintaining the status quo, transition (incremental change), and transformation (radical change). Transformative approaches are required in many cases to address systemic inequities, and a justice framework has been identified as essential to creating the transformative changes necessary for just resilience approaches (Shi et al., 2016).

There are four main justice frameworks relevant to resilience planning: recognitional justice, distributive justice, procedural justice, and the capabilities approach (CA). Recognitional justice highlights a pluralistic approach in decision-making and valuing the diverse knowledge systems of socially vulnerable populations who are typically not recognized or misrecognized, and making them politically relevant (Fraser, 1997; Schlosberg, 2012; Young, 2012). Distributive justice is the examination of the distribution of environmental risks and benefits and explores the disparities across social groups and communities within resilience planning and adaptive capacity within this context (Foster et al., 2019; McDermott et al., 2013). Procedural justice is the extent and robustness of the procedural engagement of vulnerable communities in decision-making (Foster et al., 2019). Procedural justice also advances recognitional justice by providing political agency to the vulnerable communities to influence resilience decisions and enhance community capacity. Malloy and Ashcraft (2020, p. 4) define capability as the "resources, opportunities, freedoms, and institutions necessary for individuals and groups to exist as full members in a given society." In this framing, CA incorporates distributive, procedural, and recognitional justice and there is considerable overlap within them (Malloy & Ashcraft, 2020; Schlosberg et al., 2017). Contextual justice is another framing that is similarly used within adaptation and is defined by Foster et al. (2019, p. 3) as the "social,

economic, and political factors and processes that contribute to uneven vulnerability and shape adaptive capacity," which was based on McDermott et al. (2013). While contextual equity examines the root causes of vulnerability or preexisting conditions, the capabilities approach can, in addition, probe how specific capabilities are explored within certain settings alongside cataloging the ways that climate change causes injustices and undermines the foundation of human capabilities (Foster et al., 2019; McDermott et al., 2013; Schlosberg, 2012). Most of the literature on justice in resilience planning has largely focused on distributive and procedural justice (Fainstein, 2018; Holland, 2017; Paavola, 2008; Paavola & Adger, 2006) but less on capability or these approaches together (Pelling, 2011; Schlosberg et al., 2017). Hence, CA is not just about understanding distribution of resources, procedural engagement, and recognition of vulnerable groups within resilience planning, but also about assessing how resources or services enhance quality of life. In this study we explore how the 100 Resilient Cities program improves capabilities through their interventions and how the agency of the disadvantaged communities are enhanced, which in turn enables everyday adaptation (Wilden & Feldmeyer, 2021).

A growing group of scholars calls for a critical assessment of resilience planning and questions if it is justly sustainable and beneficial for all. Recent studies have investigated justice within the resilience plans written as part of the 100 Resilient Cities program; however, none have developed an index to compare the extent to which justice was incorporated within resilience planning across cities (Fitzgibbons & Mitchell, 2019; Grove et al., 2020; Meerow et al., 2019). The objective of this study is to develop a "Just Resilience Index" that can both assess the extent to which justice frameworks have been included in resilience plans and can provide guidance for how future planning efforts can centralize justice. In this research, we conduct a document analysis of 11 city resilience plans across the United States to examine how justice considerations are incorporated within resilience planning. This assessment builds on the theoretical framing of the capabilities approach as framed by Schlosberg (2012), Schlosberg et al. (2017), Sen (2009), and Nussbaum (2011).

METHODS

A document analysis was conducted of 11 coastal U.S. city resilience plans that were written as part of the 100 Resilient Cities (100 RC) program to investigate how elements of justice have been incorporated into resilience planning. The 100 Resilient Cities (100RC) program (2013–2019) provided funding to select cities across the globe to hire a chief resilience officer and to develop a resilience plan. A prior study found that diversity, equity, inclusion, and justice was the most considered theme within the actions of 11 resilience plans (Raub et al., 2021). The current study furthers the analysis by Raub et al. (2021) and examines the resilience plans of Boston, New York City, Miami, Norfolk, New Orleans, Los Angeles, San Francisco, Oakland, Berkeley, Seattle, and Honolulu.

Just Resilience Index (JRI)

The Just Resilience Index (JRI) was developed to analyze the extent to which justice was incorporated within resilience plans. We examined how justice themes were addressed specifically by the actions within the resilience plans. The index examined the following: (1) the populations that were recognized and awarded benefits (i.e., recognitional justice); (2) instances where distributive justice, procedural justice, and community capabilities were addressed; (3) the strength of the focus on justice in each action; and (4) the justification or rationale for the incorporation of justice within the action. See the summary of the scoring criteria used in the JRI in

Table 1. The Just Resilience Index: Scoring Criteria

Category	Point Values	Criteria
Recognitional justice	0, 1	0 = no population identified (e.g., just referencing equity, vulnerable populations), 1 = specific population(s) identified (e.g., communities of color, low-income communities).
Frameworks of justice	0, 1	0 = both distributive and procedural equity not included in the action, 1 = both included in the action.
Strength of focus	0, 1	0 = justice not the primary focus of the action, 1 = justice was the primary focus.
Justification for inclusion of justice	0, 1	0 = no justification of justice articulated, and 1 = justification articulated.

Table 1. The codebook for the study was tested for intercoder reliability until a minimum of 90% reliability was obtained between independently coded sets of resilience plan actions (see the Appendix for more details).

Per the JRI scoring criteria, each action had a potential for a maximum of 4 points. As each resilience plan had a different number of total actions, each has a different maximum potential JRI score. For example, Boston only had 23 actions with a maximum potential score of 92, whereas New York City had 101 actions with a maximum potential score of 404. Therefore, JRI scores were compared across cities using the percentage of the actual score as compared to the potential score. The criteria used for each JRI category are detailed in the following sections.

Recognitional Justice

We examined how seven populations were recognized in the resilience plans: socioeconomic status (income), race, gender, ability, English proficiency (more broadly, cultural accommodations), immigrants and refugee communities, those impacted by incarceration and policing, and other. These categories were not preselected, but rather determined through pilot analysis of the 11 resilience plans. These populations were identified when an action directly recognized the above population or when it used indirect language (e.g., bettering community–police relationships indicated the population impacted by incarceration and policing).

Frameworks of Justice

Justice frameworks included distributive justice, procedural justice, and capabilities approach applied in the resilience actions. Distributive justice was addressed when an action acknowledged or sought to rectify the differences in how benefits and costs were distributed across specific populations, such as how communities of color may lack access to fresh and healthy foods compared to the rest. Procedural justice was defined as actions that sought to include recognized populations within the process, such as ensuring that people of color are included in decision-making. Enhancing community capability was categorized as any action that sought to enhance the capacities and the security of vulnerable communities, such as job training programs or increasing the number of affordable housing units in a new development. However, as CA is "multi-dimensional, providing a 'thick' and heterogenous conception of what constitutes human flourishing rather than attempting to reduce this to a single denominator or element of life" (Pellicer-Sifres et al., 2021, p. 1028), we explore it qualitatively rather than attempt to quantify its inclusion in resilience plan actions.

Strength of Focus

The focus category was used to distinguish between the extent to which justice was included in individual actions. For example, some actions centralized justice, whereas others were primarily on a separate topic but would include one sentence relating the topic to a justice principle. Therefore, JRI points were only assigned to actions where the primary focus was on justice.

Justification

The justification category was included to distinguish between actions that articulated why justice principles were included and those that did not. Justification revealed a distinct level of awareness about the inclusion of justice.

Comparison to City Demographics

To better understand the context in which the resilience plans were written, the JRI scores were compared to the demographics of each city. Demographic information was collected from the U.S. Census and the Department of Housing and Urban Development (HUD): median income levels, percentages of the population below the poverty line, and the racial makeup of each city's population.

RESULTS

This section details the JRI scores per city. The frameworks of justice (recognitional, distributive, procedural, and capabilities approach) addressed by the resilience plan actions are addressed within the JRI scores. Finally, the JRI scores are compared to city demographics.

Just Resilience Index

The JRI scores the actions within each city's resilience plan according to how each action included recognitional, distributive, and procedural justice, focused on justice (i.e., mention vs. primary focus of the action), and provided justification for its equity focus (see Table 2).

Recognitional Justice

Out of the total 246 justice-related actions, 208 actions (85%) recognized at least one specific population. Of the seven population categories examined, the low-income population was the most recognized (52%, 127 of 246), followed by ability (19%, 47 of 246) and race (18%, 44 of 246) within the justice-related actions (see Table 3). Of the 44 actions (out of 593 actions) that included race, only eight actions from four plans recognized specific racial groups; most (82%) addressed race broadly. For example, 78% (18 of 23 actions) of Boston's actions explored racial implications, while only 2% (1 of 45) of the actions addressed racial concerns in New York City's plan, and other cities like Miami, Norfolk, and San Francisco did not address race in their actions. Alternatively, immigrant and refugee concerns were recognized by only five cities. Only four cities—Boston, Los Angeles, New York City, and Seattle—addressed (or acknowledged) the concerns of all seven populations.

Distributive Justice

There was variability in how the 11 cities included distributive justice within their actions. Seattle incorporated distributive justice the most in 89% (39 of 44) of its justice-related actions, and Oakland included distributive justice the least in 48% (13 of 27) of its justice-related

Table 2. Just Resilience Index Scores of the Eleven Resilience Plans

City (Justice-Related Actions/Total Actions)	Recognitional Justice	Both Distributive and Procedural Justice	Primary Focus	Justification	JRI Score % (Actual Score/Potential Score)	
	% Per No. of Justice-Related Actions				Per Justice-Related Actions	Per Total Actions
Berkeley (8/27)	8 (100%)	3 (38%)	3 (38%)	4 (50%)	56% (18/32)	17% (18/108)
Boston (23/23)	20 (87%)	15 (65%)	15 (65%)	22 (96%)	78% (72/92)	78% (72/92)
Honolulu (9/44)	9 (100%)	4 (44%)	4 (44%)	7 (78%)	67% (24/36)	14% (24/176)
Los Angeles (38/96)	30 (79%)	10 (26%)	27 (71%)	17 (45%)	55% (84/152)	22% (84/384)
Miami (16/59)	14 (88%)	5 (31%)	8 (50%)	3 (19%)	47% (30/64)	13% (30/236)
New Orleans (9/41)	7 (78%)	1 (11%)	5 (56%)	1 (11%)	39% (14/36)	9% (14/164)
New York City (45/101)	40 (89%)	16 (36%)	29 (64%)	25 (56%)	61% (110/180)	27% (110/404)
Norfolk (9/42)	8 (89%)	0 (0%)	6 (67%)	0 (0%)	39% (14/36)	8% (14/168)
Oakland (27/37)	18 (67%)	3 (11%)	12 (44%)	3 (11%)	33% (36/108)	24% (36/148)
San Francisco (18/54)	12 (67%)	2 (11%)	6 (33%)	2 (11%)	31% (22/72)	10% (22/216)
Seattle (44/69)	4 (9%)	17 (39%)	32 (73%)	28 (64%)	46% (81/176)	29% (81/276)
Total (246/593)	208 (85%)	76 (31%)	147 (60%)	112 (46%)	55% (543/984)	23% (543/2372)

Table 3. Populations Recognized Within Resilience Actions

City	Justice-Related Actions/Total Actions in Plan (% of total)	Income	Race	Gender	Ability	English Proficiency	Immigrant & Refugee Communities	Incarceration & Policing	Other
		Total Actions (% of Justice-Related Actions)							
Berkeley	8/27 (29.6%)	3 (38%)	4 (50%)	–	2 (25%)	1 (13%)	–	–	3 (38%)
Boston	23/23 (100%)	9 (39%)	18 (78%)	2 (9%)	3 (13%)	2 (9%)	1 (4%)	2 (9%)	16 (70%)
Honolulu	9/44 (20.4%)	6 (75%)	1 (11%)	–	3 (38%)	1 (11%)	–	–	4 (50%)
Los Angeles	38/96 (39.5%)	16 (42%)	1 (3%)	5 (13%)	9 (24%)	3 (8%)	3 (8%)	3 (8%)	30 (79%)
Miami	16/59 (27.1%)	12 (75%)	–	1 (6%)	2 (13%)	–	–	3 (19%)	8 (50%)
New Orleans	9/41 (21.9%)	5 (56%)	1 (11%)	–	–	–	–	1 (11%)	7 (78%)
New York City	45/101 (44.5%)	23 (51%)	1 (2%)	9 (20%)	17 (38%)	6 (13%)	4 (9%)	8 (18%)	31 (69%)
Norfolk	9/42 (21.4%)	7 (78%)	–	–	–	–	–	1 (11%)	1 (11%)
Oakland	27/37 (72.9%)	12 (44%)	9 (33%)	1 (4%)	3 (11%)	5 (19%)	–	2 (7%)	23 (85%)
San Francisco	18/54 (33.3%)	9 (50%)	–	–	3 (17%)	1 (6%)	–	–	9 (50)
Seattle	44/69 (63.8%)	25 (57%)	10 (23%)	3 (7%)	5 (11%)	4 (9%)	4 (9%)	5 (11%)	24 (55%)
TOTAL	246/593 (41.5%)	127 (52%)	45 (18%)	21 (9%)	47 (19%)	23 (9%)	12 (5%)	25 (10%)	156 (63%)

actions. Distributive justice actions included providing equitable access to goods (47%, 85 of 180), information (3%, 6 of 180), and services (49%, 89 of 180) to vulnerable populations. For example, Boston's Initiative 19 detailed equitable implementation of resilient, low-carbon energy sources, including local energy generation and microgrids, in vulnerable neighborhoods. San Francisco focused on the equitable distribution of information as they ensure a culturally competent and multilingual campaign to spread information about the programs. Norfolk defined equitable distribution of services to build financial stability of unbanked and underbanked low-income individuals and families through banking services.

Procedural Justice

How the cities included procedural equity within their justice-related actions had the greatest variability. First, we examined each city's "active engagement" with community groups/members in the development of their resilience plans and found that 10 of the 11 cities provided accounts of community engagement in the preparation of their plans. However, just four cities (New York City, Boston, Honolulu, and Miami) demonstrated procedural justice, which included engaging vulnerable populations in resilience planning (as opposed to engagement with the broader community). Secondly, we examined the procedural justice proposed in the implementation of the justice-related actions. Boston incorporated procedural justice into 87% (20 of 23) of its justice-related actions, while New Orleans, Norfolk, and San Francisco included it the least. Procedural justice was commonly addressed in policy measures (41%, 47 of 114), community engagement (42%, 48 of 114), and inclusion (removal of barriers) (17%, 19 of 114) across the 11 resilience plans. New York City's plan recognized that "decisions about City policies and initiatives should be informed by broad public engagement with a wide range of stakeholders, including residents whose voices are not heard because of barriers such as language and time" (City of New York, 2015), which acknowledges the importance of community engagement in policymaking.

Both Distributive and Procedural Justice

Of the justice-related actions, only 31% addressed both distributive and procedural justice. Boston had the highest (65%) and Norfolk had the lowest percentage (0%) of, including both frameworks within their actions. Of the justice frameworks employed within the resilience plan actions, distributive justice was the most frequently included (73%, 180 of 246) followed by procedural justice (46%, 114 of 246) (see Table 4).

Capabilities Approach (CA)

The capabilities approach defines the specific approaches, services, and investments made to improve the functioning and capabilities of the most vulnerable communities and integrates aspects of recognitional, distributive, and procedural justice. Capabilities were frequently considered within housing initiatives, programs for community well-being, and building neighborhood relationships to encourage social cohesion. Examples of CA include, how Seattle (Action 13.2) encouraged social cohesion by implementing a community-based policing model that aims to build a trusting relationship between police and the greater community, as well as creating a special pilot team to respond to nonemergency 911 calls. Honolulu (Action 4) enacted a progressive property tax that keeps housing affordable for low-income residents. Berkeley recommended building the capacity of the community by reducing the achievement gap in Berkeley public schools, as well as furthering racial equity and helping students with college and career readiness.

Table 4. Frameworks of Justice Addressed Within Resilience Plans

City	Justice-Related Actions	Distributive Equity (DE)	Procedural Equity (PE)	Actions with Both DE and PE
		No. of Inclusions (% of Justice-Related Actions)		
Berkeley	8	4 (50%)	6 (75%)	3 (38%)
Boston	23	17 (74%)	20 (87%)	15 (65%)
Honolulu	9	7 (78%)	6 (67%)	4 (44%)
Los Angeles	38	30 (79%)	14 (37%)	10 (26%)
Miami	16	10 (63%)	8 (50%)	5 (31%)
New Orleans	9	7 (78%)	2 (22%)	1 (11%)
New York City	45	33 (73%)	23 (51%)	16 (36%)
Norfolk	9	6 (67%)	2 (22%)	0 (0%)
Oakland	27	13 (48%)	9 (33%)	3 (11%)
San Francisco	18	14 (78%)	4 (22%)	2 (11%)
Seattle	44	39 (89%)	20 (45%)	17 (39%)
TOTAL	246	180 (73%)	114 (46%)	76 (31%)

Focus

The "focus" category of the JRI measured the extent to which the entire action centralized justice. Seattle had the highest percentage of its justice-related actions with a primary focus on justice (73%). Meanwhile, San Francisco had the lowest percentage of its justice-related actions with a primary focus on justice (33%). Examples of actions with a primary focus on justice include Seattle's "build more housing for families of all income levels" action to keep up with the city's increased demand and Boston's "Connect Bostonians to Reflect and Confront Racial Inequity."

Justification

This category explored if the actions provide clear justifications for incorporating justice. Less than half of the justice-related actions (46%) included a justification for its focus on justice. The plans cover a wide range of scores, from 96% of Boston's justice-related actions providing clear justification to none provided for Norfolk. For example, New York City's "Improve food access, affordability, and quality, and encourage a sustainable, resilient food system" action begins with a justification that "the City's current food system does not allow for equitable access to nutritious food" and went on to characterize why this was true in New York City.

JRI Scores

The JRI scores for each plan were calculated in two ways: first, the percentage per the *total number of actions* (actual score / 4 potential points × total actions in each plan) to assess the breadth of engagement with frameworks of justice and, second, the percentage per the *justice-related actions* (actual score / 4 × total justice-related actions in each plan) to assess the depth of engagement on justice issues. Boston, Seattle, and New York City achieved the highest JRI scores across all actions (breadth), and Boston, Honolulu, and New York City achieved the

highest JRI scores across the justice-related actions (depth). The Honolulu resilience plan had the fifth lowest JRI score when calculated against all actions (14%), but the second-highest JRI score when calculated only against justice-related actions (67%). The inverse of this can be seen with the Oakland plan. Oakland had the fourth highest JRI score when the score was calculated for the full plan (24%), but had the second-lowest JRI score when calculated against only its justice-related actions (33%). Other plans were more consistent, with Boston scoring the highest across both calculations and Norfolk ranking in the bottom three.

Demographic Data of the Eleven Cities Compared to JRI Scores

An analysis comparing resilience plans to their city demographics was done by looking at data from the U.S. Census Bureau from 2019 and from the U.S. Department of Housing and Urban Development from early 2020. The results indicated that income was the most recognized population and specific racial groups were the least (only 8 of 44 actions that recognized race identified a specific racial group) across the 11 resilience plans. To investigate these results further, the two demographic statistics highlighted in this next phase of analysis were the percent White (non-Hispanic) and the percent homelessness in each city.

The percentage of a city that is White and non-Hispanic was not found to be correlated with a plan's performance on the JRI (R^2 = 0.076) (see Figure 1). Anecdotally, cities with a higher percent of White residents tended to have higher JRI scores. For example, Boston has a significantly higher JRI score than the racial makeup of the city would suggest, and Seattle has the highest percentage of White residents (64%) and the second-highest JRI score based on the total actions (29%). Conversely, Miami has the lowest percentage of White residents (11%) and the fourth-lowest JRI score based on total actions within the resilience plan (19%).

The percentage of a city's population that is experiencing homelessness was found to have a low correlation with the percent of a plan's justice-related actions that reference income (R^2 = 0.419) (see Figure 2). The data is derived from a program within the U.S. Department of Housing and Urban Development called Continuums of Care. Miami and Norfolk have the lowest percentages of people experiencing homelessness (0.13% and
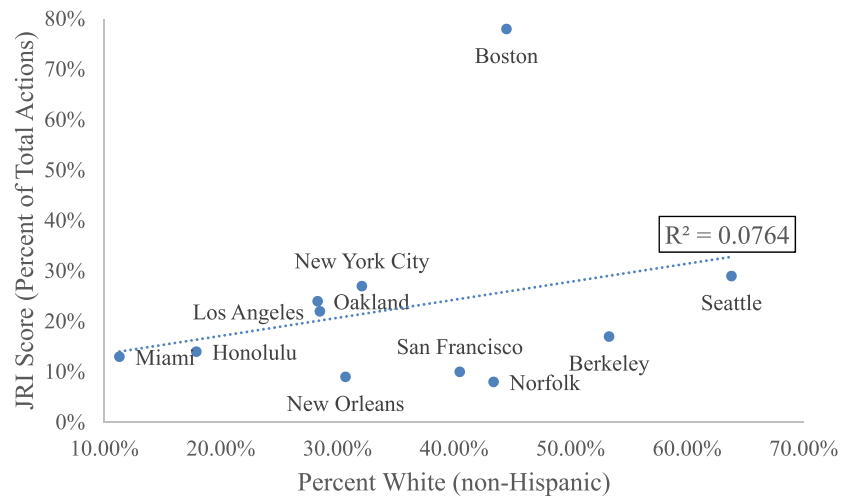

Figure 1. The percentage of the JRI score compared to the percent of the city's population that is White (non-Hispanic) from 2019.
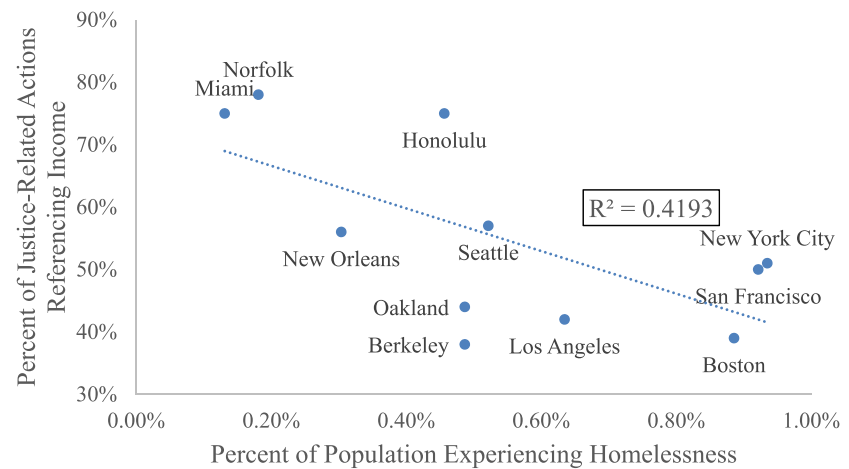
Figure 2. The percentage of the justice-related actions that refer to income and the percent of the city's population that is experiencing homelessness in the corresponding U.S. Department of Housing and Urban Development Continuums of Care.

0.18%) and have the two highest rates of references to income within their justice-related actions (75% and 78%, respectively). Meanwhile, Boston, San Francisco, and New York City have the highest rates of people experiencing homelessness (0.89%, 0.92%, and 0.93%), and all have fewer references to income, ranking them in the lower half of plans (39%, 50%, and 51%, respectively).

DISCUSSION

A document analysis of 11 coastal U.S. city resilience plans found that justice was not uniformly considered across the plans. The five key findings from this study are: (1) The concerns of the low-income population were the most recognized within the resilience plan actions; (2) procedural equity was the least addressed in the study and distributive equity was better addressed; (3) the breadth and the depth to which justice issues are incorporated matters and needs to be considered in equity-based assessments; (4) leadership differences between the cities may explain some of the differences in how justice was incorporated in resilience plans; and (5) the JRI could provide a framework to guide cities in incorporating frameworks of justice into their own planning efforts.

The Concerns of the Low-Income Population Were the Most Recognized Within the Resilience Plan Actions

Over 50% of the justice-related actions recognized the needs of the low-income population and only 18% addressed race. This difference in emphasis could be because income is a functional status, whereas race is a demographic status; however, it is imperative that racial disparities be more directly considered in resilience planning. Litman (2012) makes the argument that in some cases it is preferable to plan for functional statuses (e.g., income or ability) rather than demographic statuses (e.g., race or age) since they are more ambiguous, so those who are a part of the functional group but not the demographic group do not feel alienated. While income inequality in the United States may address some racial concerns as more people of color are low-income (Akee et al., 2019) and are more likely to experience homelessness (U.S. Department of Housing and Urban Development, 2020), addressing income inequality

alone does not address issues related to racial inequality and systemic racism. Systemic issues of redlining and environmental inequities uniquely place communities of color at risk, and particular attention is required to redress disparities stemming from systemic racism, so it is not perpetuated. Within actions about race, very few of the references were specific to racial groups. Some plans used generic terms such as "people of color" or "racial equity," without specifying the concerns of Black, Indigenous, or Hispanic communities. Of the 45 actions that recognized race, only eight of them (18%) mentioned a specific racial identity or population. Even Boston, with 78% of its actions recognizing race, only mentioned one specific racial identity in one action, pointing to a reluctance of these plans to discuss race in depth.

Resilience planning in an equitable way requires understanding the needs of specific vulnerable communities, and not referring to race as a monolith. Bonds (2018) shows that if transformative measures are not taken, resilience approaches can uphold systemic racism and maintain the status quo. A panel on how legacies of slavery and racial divisions could be addressed in resilience planning found a compulsion to recoil from assertions of racial inequalities as political problems (Grove et al., 2020), an observation that alludes to the difficulties in addressing issues related to systemic racism. Meerow et al. (2019) argue that "by making recognition one of the core elements of equity, especially in the political sphere, we may be better equipped to address the needs of those who are misrecognized and politically excluded from climate adaptation efforts" (p. 804). Young (2012) extends this argument by noting that distributive injustice itself stems from lack of recognition. Hence, an understanding of the historical, sociocultural, and political background of vulnerable communities can better inform resilience planners of the structural conditions that cause disproportionate poverty, increased susceptibility to risks, lack of access to services, and exclusion (Bulkeley et al., 2013).

Procedural Equity Was the Least Addressed Within Resilience Plan Actions and Distributive Equity Was the Most Addressed

Most (73%) of the actions addressed distributive justice, which is consistent with other studies that found that "when cities do address justice issues, they focus on distributive equity, including more equitable access to infrastructure, goods, services, and opportunities. Fewer strategies focused on procedural or recognitional justice" (Meerow et al., 2019, p. 805). Though the capabilities approach is meant to increase the agency of individuals and communities (Wilden & Feldmeyer, 2021), this study shows that the most vulnerable communities were not actively engaged in improving the capabilities and distributive inequities. Just four cities (New York City, Boston, Honolulu, and Miami) engaged vulnerable populations in resilience planning. Prior research has shown that vulnerable populations tend to be the least represented at public meetings, local planning, and decision-making (Laurian, 2004; Schlosberg et al., 2017), and how to improve the functional capabilities of the most vulnerable population requires greater focus within resilience research (Schlosberg & Collins, 2014, p. 446). But this research shows that the community's needs and vulnerabilities were addressed based on minimal recognition of impacted communities and were primarily based on the needs of the low-income population, with little procedural engagement.

The Breadth and the Depth to Which Justice Issues Are Incorporated Matters and Needs to Be Considered in Equity-Based Assessments

It is not only important to simply incorporate justice within resilience planning, but it also matters how justice is incorporated. The differences between the full plan and the justice-

related action calculations of the JRI scores are important to note as it indicates that some plans include justice across many actions, but they do not address it in depth, while other plans only address it in a few of their actions, but address justice much more comprehensively. For example, the Honolulu resilience plan achieved only 14% of its potential JRI score when calculated across all the actions within its resilience plan, but it achieved 67% of its potential score when calculated against just its justice-related actions, demonstrating depth in incorporation of justice within its resilience plan actions. Therefore, justice should both be included in as many actions as possible and given meaningful consideration.

The justification category was the best predictor of the overall JRI score and was the most variable across the cities. The four plans that achieved the highest justification scores (Boston, 96%, Honolulu, 78%, New York City, 56%, and Seattle, 64% when looking only at justice-related actions) did well across all the JRI elements, and the plans that scored poorly (Norfolk, 0%, New Orleans, 11%, Oakland, 11%, and San Francisco, 11% when looking only at justice-related actions) did poorly across most of the other categories as well. Cities that are intentional about integrating aspects of justice into all of city planning are more likely to acknowledge the problems that their cities face with respect to justice, as opposed to cities who only recognize justice concerns/values in specific instances. Researchers note in other 100RC cities that in order to access equity and justice, these plans must identify these concerns as integral components of the plan (Fitzgibbons & Mitchell, 2021).

Leadership Differences Between the Cities May Contribute to Understanding How Justice Was Incorporated in Resilience Plans; However, This Merits Further Analysis

The political affiliation of each mayor and the educational/career background of each chief resilience officer (during the time the plan was written) may have played a role in the incorporation of justice within resilience plans; however, further analysis is needed. Most of the mayors that enacted the resilience plans were Democrats (11 of 13—the Miami resilience plan was written jointly with two surrounding counties, so it is associated with three mayors). Only 4 of the 11 Chief Resilience Officers (Boston, Seattle, Oakland, and Honolulu) had a background or experience with a focus on justice. Dr. Atyia Martin (Boston) has a history of racial justice work, Katya Sienkiewicz (Seattle) has a background in refugee work, Kiran Jain (Oakland) has a background that includes work with legal and civil rights, and Joshua Stanbro (Honolulu) received an award for Native Hawaiian rights (Martin, n.d.; Sienkiewicz, n.d.; Jain, n.d.; Sierra Club of Hawai'i, n.d.). Boston, Seattle, and Oakland were each the first, second, and fourth (respectively) cities according to the full-plan calculations (breadth) and Boston and Honolulu were each the first and second (respectively) cities according to the justice-related action calculations (depth). Anecdotally, the background of those in charge of writing the plans may have influenced the extent to which justice was included within resilience planning. This is supported by a recent study of equity in decision-making for climate adaptation, which suggests that new equity planners are needed to advance inclusive participation in decision-making (Chu & Cannon, 2021).

Another factor could be that the specific challenges that the cities have faced (and are currently facing) may have influenced the ways in which justice was included within the plans. For example, the Seattle resilience plan recognized income in many of its actions and the city has an affordability crisis (Caldararo, 2017). This is consistent with a study that reports that staff who worked on the creation of Toronto's resilience plan for 100RC stated that the push for their plan to focus on equity came from feedback from the public, not from the 100 Resilient Cities program (Fitzgibbons & Mitchell, 2021).

The Just Resilience Index Could Provide a Framework to Guide Cities in Incorporating Frameworks of Justice Into Their Own Planning Efforts

The JRI is not only useful as a method to analyze and compare existing planning efforts, but it can also be used as a guide for how to meaningfully incorporate justice during the development of future planning efforts. Several key lessons from this analysis can guide future resilience planning. The first key lesson is to make sure that the four justice frameworks (recognitional justice, procedural justice, distributive justice, and capabilities approach) are incorporated into as many of the resilience plan actions as possible, and second, to make sure that they are a central focus of each action they are incorporated within. Specifically, the incorporation of procedural justice should begin at the earliest phases of plan development when considering who will be tasked with developing said plan and whose voices will be heard during any needs assessments or community forums. For example, intentionally seeking to increase procedural justice may be applied as seeking someone with demonstrated experience with justice to be involved in writing the plan or inviting key stakeholders from communities that have recognized vulnerabilities (recognitional justice) to serve a role as well. A strategy that has been demonstrated to address equity is the provision of stipends as compensation for time (Bierer et al., 2021; Gelinas et al., 2020) to offset missed wages, child care, or transportation costs, or other costs that may have otherwise prohibited the involvement of key stakeholders. Another strategy is to develop meaningful relationships with "knowledge brokers" (Cvitanovic et al., 2017; Davison et al., 2015), which means cultivating a relationship with members of vulnerable communities who serve in a trusted leadership position within that community. Another key lesson is to use the "recognized populations" section of the codebook (see the Appendix) as guidance to ensure vulnerable populations are specifically identified, meaningfully incorporated into the development and planning process, and that their diverse needs are considered within each relevant action. We also want to highlight the importance of using mixed methods to analyze JRI as not all measures of justice can be easily quantified, especially CA. CA shows the interdependence of distributive, procedural, and recognitional justice but goes beyond exploring just how resources and services are distributed and how communities are engaged and recognized (Schlosberg, 2007).

LIMITATIONS AND FUTURE RESEARCH

One limitation of this research is that it only included resilience plans that were written as part of the 100RC program, which meant that each city was following the same guidance for plan development. Future research should conduct interviews with those who wrote the resilience plans to investigate the decision-making behind plan development and why justice was included to the extent that it was. These interviews could also assess how many of the justice-related initiatives have been implemented and what impact they may have had. Additionally, future research should expand this analysis to include the planning efforts of inland communities and conduct a more thorough analysis of how a comprehensive set of community demographic statistics may correlate with JRI scores. Finally, future research should include the study of the application of the JRI to the development of resilience planning efforts.

CONCLUSIONS

The threats of climate change are not distributed equitably. To ensure that resilience plans do not perpetuate systemic injustices, theories of justice need to be centered within resilience planning. Our research finds that despite the use of the language of justice, many of the resilience plans still do not have an explicit focus on justice. Our study found that recognitional

and procedural justice need to be better addressed within resilience plans. We also show how capability approaches can help clarify how community security and well-being are enhanced. Cities that enacted community-based policing, nonemergency helplines, progressive taxes, and reducing achievement gaps may improve community security and well-being and its capability to respond to risks or capacity to thrive, but additional studies are required to validate that such efforts enhance resilience. The JRI developed in this study can be an effective model to explore how justice frameworks are incorporated within resilience plans. While JRI affords a comparative evaluation of theories of justice within resilience plans, we also highlight the need for mixed methods for an effective analysis of justice frameworks.

Without the identification of who is excluded, who benefits, and whose knowledge systems, traditions, and cultures are valued, resilience planning ignores the social structures and institutional processes that perpetuate systemic inequities. Our recommendations include that (1) resilience plans intentionally prioritize theories of justice, (2) the plans should be coproduced by deeply engaging vulnerable communities to understand their specific circumstances and needs in resilience planning and its subsequent implementation, and (3) case studies of community-based resilience planning in socially and economically vulnerable communities are required to improve current practices of incorporating equity within community-based adaptation (Foster et al., 2019). Just resilience approaches can build more resilient communities by affording fair opportunities and outcomes to all.

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REFERENCES

Adger, W. N. (2016). Place, well-being, and fairness shape priorities for adaptation to climate change. *Global Environmental Change*, *38*, A1–A3. https://doi.org/10.1016/j.gloenvcha.2016.03.009

Adger, W. N. (2010). Social capital, collective action, and adaptation to climate change. In M. Voss (Ed.), *Der Klimawandel: Sozialwissenschaftliche Perspektiven* (pp. 327–345). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-92258-4_19

Adger, W. N., Paavola, J., Huq, S., & Mace, M. J. (Eds.). (2006). *Fairness in adaptation to climate change*. MIT Press. https://doi.org/10.7551/mitpress/2957.001.0001

Agyeman, J. (2013). *Introducing just sustainabilities: Policy, planning and practice*. Zed Books. https://swbplus.bsz-bw.de/bsz421254564cov.htm

Agyeman, J., Schlosberg, D., Craven, L., & Matthews, C. (2016). Trends and directions in environmental justice: From inequity to everyday life, community, and just sustainabilities. *Annual Review of Environment and Resources*, *41*(1), 321–340. https://doi.org/10.1146/annurev-environ-110615-090052

Akee, R., Jones, M. R., & Porter, S. R. (2019). Race matters: Income shares, income inequality, and income mobility for all U.S. races. *Demography*, *56*(3), 999–1021. https://doi.org/10.1007/s13524-019-00773-7, PubMed: 30945204

Anguelovski, I., Shi, L., Chu, E., Gallagher, D., Goh, K., Lamb, Z., Reeve, K., & Teicher, H. (2016). Equity impacts of urban land use planning for climate adaptation: Critical perspectives from the Global North and South. *Journal of Planning Education and Research*, *36*(3), 333–348. https://doi.org/10.1177/0739456X16645166

Bierer, B. E., White, S. A., Gelinas, L., & Strauss, D. H. (2021). Fair payment and just benefits to enhance diversity in clinical research. Journal of *Journal of Clinical and Translational Science*, *5*(1), Article e159. https://doi.org/10.1017/cts.2021.816, PubMed: 34527298

Bonds, A. (2018). Refusing resilience: The racialization of risk and resilience. *Urban Geography*, *39*(8), 1285–1291. https://doi.org/10.1080/02723638.2018.1462968

Bulkeley, H., Carmin, J., Castán Broto, V., Edwards, G. A. S., & Fuller, S. (2013). Climate justice and global cities: Mapping the emerging discourses. *Global Environmental Change*, *23*(5), 914–925. https://doi.org/10.1016/j.gloenvcha.2013.05.010

Bullard, R. D., & Wright, B. (2009). *Race, place, and environmental justice after Hurricane Katrina: Struggles to reclaim, rebuild, and revitalize New Orleans and the Gulf Coast*. Routledge.

Caldararo, N. (2017). The housing crisis and homelessness: A San Francisco ethnography. *Urbanities*, *7*(1), 3–21.

Chu, E. K., & Cannon, C. E. (2021). Equity, inclusion, and justice as criteria for decision-making on climate adaptation in cities. *Current Opinion in Environmental Sustainability*, *51*, 85–94. https://doi.org/10.1016/j.cosust.2021.02.009

City of New York. (2015). *One New York: The plan for a strong and just city*. https://resilientcitiesnetwork.org/downloadable_resources/Network/New-York-City-Resilience-Strategy-English.pdf

Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E., & Webb, J. (2008). *Community and regional resilience: Perspectives from hazards, disasters, and emergency management* (CARRI Research Report No. 1). Community & Regional Resilience Institute.

Cvitanovic, C., Cunningham, R., Dowd, A. M., Howden, S. M., & van Putten, E. I. (2017). Using social network analysis to monitor and assess the effectiveness of knowledge brokers at connecting scientists and decision makers: An Australian case study. *Environmental Policy and Governance*, *27*(3), 256–269. https://doi.org/10.1002/eet.1752

Davison, C. M., Ndumbe-Eyoh, S., & Clement, C. (2015). Critical examination of knowledge to action models and implications for promoting health equity. *International Journal for Equity in Health*, *14*, Article 49. https://doi.org/10.1186/s12939-015-0178-7, PubMed: 26022369

Eriksen, S. H., Nightingale, A. J., & Eakin, H. (2015). Reframing adaptation: The political nature of climate change adaptation. *Global Environmental Change*, *35*, 523–533. https://doi.org/10.1016/j.gloenvcha.2015.09.014

Fainstein, S. (2014). Resilience and justice: Debates and developments. *International Journal of Urban and Regional Research*, *39*(1), 157–167. https://doi.org/10.1111/1468-2427.12186

Fainstein, S. (2018). Resilience and justice: Planning for New York City. *Urban Geography*, *39*(8), 1268–1275. https://doi.org/10.1080/02723638.2018.1448571

Fitzgibbons, J., & Mitchell, C. L. (2019). Just urban futures? Exploring equity in "100 Resilient Cities." *World Development*, *122*, 648–659. https://doi.org/10.1016/j.worlddev.2019.06.021

Fitzgibbons, J., & Mitchell, C. L. (2021). Inclusive resilience: Examining a case study of equity-centred strategic planning in Toronto, Canada. *Cities*, *108*, Article 102997. https://doi.org/10.1016/j.cities.2020.102997

Foster, S., Leichenko, R., Nguyen, K. H., Blake, R., Kunreuther, H., Madajewicz, M., Petkova, E. P., Zimmerman, R., Corbin-Mark, C., Yeampierre, E., Tovar, A., Herrera, C., & Ravenborg, D. (2019). New York City panel on climate change 2019 report. Chapter 6: Community-based assessments of adaptation and equity. *Annals of the New York Academy of Sciences*, *1439*(1), 126–173. https://doi.org/10.1111/nyas.14009, PubMed: 30875123

Fraser, N. (1997). *Justice interruptus: Critical reflections on the "postsocialist" condition.* Routledge.

Gelinas, L., White, S. A., & Bierer, B. E. (2020). Economic vulnerability and payment for research participation. *Clinical Trials*, *17*(3), 246–272. https://doi.org/10.1177/1740774520905596, PubMed: 32063065

Grove, K., Barnett, A., & Cox, S. (2020). Designing justice? Race and the limits of recognition in greater Miami resilience planning. *Geoforum*, *117*, 134–143. https://doi.org/10.1016/j.geoforum.2020.09.014

Holland, B. (2017). Procedural justice in local climate adaptation: Political capabilities and transformational change. *Environmental Politics*, *26*(3), 391–412. https://doi.org/10.1080/09644016.2017.1287625

Jain K. (n.d.). Bay Area: Resilient by design challenge. Retrieved June 30, 2021, from https://www.resilientbayarea.org/kiran-jain.

Laurian, L. (2004). Public participation in environmental decision making: Findings from communities facing toxic waste cleanup. *Journal of the American Planning Association*, *70*(1), 53–65. https://doi.org/10.1080/01944360408976338

Litman, T. (2012). *A new social equity agenda for sustainable transportation.* Victoria Transit Policy Institute.

Malloy, J. T., & Ashcraft, C. M. (2020). A framework for implementing socially just climate adaptation. *Climatic Change*, *160*(1), 1–14. https://doi.org/10.1007/s10584-020-02705-6

Martin, A. (n.d.). *About Dr. S. Atyia Martin.* AtyiaMartin.Com. Retrieved June 30, 2021, from https://www.atyiamartin.com/contact.

McDermott, M., Mahanty, S., & Schreckenberg K. (2013) Examining equity: A multidimensional framework for assessing equity in payments for ecosystem services. *Environmental Science & Policy*, *33*, 416–427. https://doi.org/10.1016/j.envsci.2012.10.006

Meerow, S., Pajouhesh, P., & Miller, T. R. (2019). Social equity in urban resilience planning. *Local Environment*, *24*(9), 793–808. https://doi.org/10.1080/13549839.2019.1645103

Nussbaum, M. C. (2011). *Creating capabilities the human development approach.* Orient Blackswan. https://doi.org/10.4159/harvard.9780674061200

Paavola, J. (2008). Science and social justice in the governance of adaptation to climate change. *Environmental Politics*, *17*(4), 644–659. https://doi.org/10.1080/09644010802193609

Paavola, J., & Adger, W. N. (2006). Fair adaptation to climate change. *Ecological Economics*, *56*(4), 594–609. https://doi.org/10.1016/j.ecolecon.2005.03.015

Patterson, J. J., Thaler, T., Hoffmann, M., Hughes, S., Oels, A., Chu, E., Mert, A., Huitema, D., Burch, S., & Jordan, A. (2018). Political feasibility of 1.5°C societal transformations: The role of social justice. *Current Opinion in Environmental Sustainability*, *31*, 1–9. https://doi.org/10.1016/j.cosust.2017.11.002

Pellicer-Sifres, V., Simcock, N., & Boni, A. (2021). Understanding the multiple harms of energy poverty through Nussbaum's theory of central capabilities. *Local Environment*, *26*(8), 1026–1042. https://doi.org/10.1080/13549839.2021.1952968

Pelling, M. (2011). *Adaptation to climate change: From resilience to transformation.* Routledge. https://doi.org/10.4324/9780203889046

Pelling, M., O'Brien, K., & Matyas, D. (2015). Adaptation and transformation. *Climatic Change*, *133*(1), 113–127. https://doi.org/10.1007/s10584-014-1303-0

Puszkin-Chevlin, A. (2007). *Determinants of local hazard mitigation policy and built environment vulnerability: Three case studies from Florida's Treasure Coast* (Doctoral dissertation). Columbia University.

Raub, K. B., Stepenuck, K. F., Panikkar, B., & Stephens, J. C. (2021). An analysis of resilience planning at the nexus of food, energy, water, and transportation in coastal US cities. *Sustainability*, *13*(11), Article 6316. https://doi.org/10.3390/su13116316

Schlosberg, D. (2012). Climate justice and capabilities: A framework for adaptation policy. *Ethics & International Affairs*, *26*(4), 445–461. https://doi.org/10.1017/S0892679412000615

Schlosberg, D. (2007). *Defining environmental justice: Theories, movements, and nature.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199286294.001.0001

Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: Climate change and the discourse of environmental justice. *WIREs Climate Change*, *5*(3), 359–374. https://doi.org/10.1002/wcc.275

Schlosberg, D., Collins, L. B., & Niemeyer, S. (2017). Adaptation policy and community discourse: Risk, vulnerability, and just transformation. *Environmental Politics*, *26*(3), 413–437. https://doi.org/10.1080/09644016.2017.1287628

Sen, A. (2009). *The idea of justice.* Belknap Press of Harvard University Press. https://doi.org/10.4159/9780674054578

Shi, L. (2020). From progressive cities to resilient cities: Lessons from history for new debates in equitable adaptation to climate change. *Urban Affairs Review*, *57*(5), 1442–1479. https://doi.org/10.1177/1078087419910827

Shi, L., Chu, E., Anguelovski, I., Aylett, A., Debats, J., Goh, K., Schenk, T., Seto, K. C., Dodman, D., Roberts, D., Roberts, J. T., & VanDeveer, S. D. (2016). Roadmap towards justice in urban climate adaptation research. *Nature Climate Change*, *6*(2), 131–137. https://doi.org/10.1038/nclimate2841

Sierra Club of Hawai'i. (n.d.). *Josh Stanbro announced as Honolu-lu's first chief resilience officer.* Sierra Club of Hawai'i. Retrieved June 30, 2021, from https://sierraclubhawaii.org/blog/josh -stanbro-announced-as-honolulus-first-chief-resilience-officer.

Sienkiewicz, K. (n.d.). *Katya Sienkiewicz.* LinkedIn. Retrieved June 30, 2021, from https://www.linkedin.com/in/katya-s-3a51402/.

Thomas, D. S. K., Phillips, B. D., Lovekamp, W. E., & Fothergill, A. (Eds.) (2013). *Social vulnerability to disasters.* CRC Press. https:// search.ebscohost.com/login.aspx?direct=true&scope=site&db =nlebk&db=nlabk&AN=1728756. https://doi.org/10.1201 /b14854

United Nations Framework Convention on Climate Change. (2021). *What do adaptation to climate change and climate resil-ience mean?* The Big Picture. https://unfccc.int/topics/adaptation -and-resilience/the-big-picture/what-do-adaptation-to-climate -change-and-climate-resilience-mean#eq-2

U.S. Department of Housing and Urban Development. (2020). *CoC homeless populations and subpopulations reports.* https://www .hudexchange.info/programs/coc/coc-homeless-populations-and -subpopulations-reports/?filter_Year=2020&filter_Scope=CoC &filter_State=VA&filter_CoC=&program=CoC&group=PopSub

Van Zandt, S., Peacock, W. G., Henry, D. W., Grover, H., Highfield, W. E., & Brody, S. D. (2012). Mapping social vulnerability to enhance housing and neighborhood resilience. *Housing Policy Debate, 22*(1), 29–55. https://doi.org/10.1080/10511482.2011 .624528

Wilden, D., & Feldmeyer, D. (2021). Measuring knowledge and action changes in the light of urban climate resilience. *City and Environment Interactions, 10,* Article 100060. https://doi .org/10.1016/j.cacint.2021.100060

Wolff, J., & De-Shalit, A. (2007). *Disadvantage.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199278268.001 .0001

Young, I. M. (2012). *Justice and the politics of difference.* Princeton University Press. https://doi.org/10.1515/9781400839902

Zolli, A. (2012, November 2). Learning to bounce back. *New York Times.* https://www.nytimes.com/2012/11/03/opinion/forget -sustainability-its-about-resilience.html

APPENDIX: CODEBOOK

The following is an addendum to the codebook developed by Raub et al. (2021). The DEIJ (Diversity, Equity, Inclusion, and Justice) section of the original codebook has been expanded to capture the nuances of how justice was incorporated within the actions of resilience plans.

Defining an Action (Material From Original Codebook)

Only information relating to an action should be coded. Each resilience plan provides different additional information to support the description of the action. Examples of the additional information include a description of co-benefits (sometimes called "How this will help us" or "Resilience Value"), a list of partners and leads, a description of the timeline, performance metrics, and funding sources. Call-out boxes, spotlight features, case studies, and other sup-plementary material do not count—these are often separated from the material about an action using a different color background or text.

In general, it is recommended that those using this codebook in the future code the actions multiple times in multiple sittings as specific references to the codebook elements can be easy to miss upon initial review. Additionally, it is important to only code for explicit instances of these categories. Assumptions do not count.

Recognized Populations

More than one population can be included within each action. Additionally, justice organiza-tions (etc.) mentioned within an action do not count unless directly impacted by or will impact the action.

Socioeconomic Status (Income)

- Actions recognizing those experiencing homelessness, certain income levels (mid- to low-income). Includes job preparation services that target low-income or communities with high portions of its members experiencing homelessness or financial hardship. Includes "unbanked" and "underbanked" individuals or populations. Reference to con-centrated poverty and barriers to employment (as employment can be necessary to access income).

- Economic mobility does not count unless they specifically reference income groups.
- Includes reference to Medicaid communities.

Race

- Actions highlighting the need to better serve specific racial communities, direct reference to racial justice, communities of color, or other specific racial groups that have historically been marginalized. Includes reference to minority populations only if the action specifies that minority refers to a specific racial population (otherwise, it is "other").

Gender

- Reference or focus on gender, women, and the LGBTQ community. This includes W/MBE's (Women and Minority Owned Business Enterprises).

Ability

- Elderly and senior populations (reference to "all ages"), actions related to (dis)ability and accessibility. Includes mental ability, and related services, as long as it is referenced within the context of justice (mental health services alone do not count unless it is in the context of a barrier or limitation of a specific population); chronic illness and medical illness; includes communities facing addiction (opioid user populations).
- Does not include "user friendly" design of websites/information unless it is in the context of language services, sign language, audio recordings, and so on.
- Must be able to distinguish between accessibility in terms of (dis)ability and geographic/general limitations, especially in terms of transportation. Unless the action is explicit in how they are using the term, transportation accessibility does not count.

English Proficiency (More Broadly, Cultural Accommodations)

- Includes language and translation services (for those whose primary language is not English), culturally appropriate offerings or accommodations.
- Seeking to include cultural organizations in action development or implementation.

Immigrants and Refugee Communities

- Specific reference to immigrant and/or refugee communities. These terms must be explicitly used within the action.
- Includes DACA (Deferred Action for Childhood Arrivals) recipients, the legal process surrounding legalization and naturalization, etc.

Those Impacted by Incarceration and Policing

- Services for the formerly incarcerated, reducing incarceration rates, reentry services, decriminalization of specific offences. Police relations with communities, criminal (in)justice (reform).

- Violence reduction and crime reduction (strategies, etc.) as long as they are not in the context of increasing arrests, police presence, or other problematic strategies.

Other

- The criteria for the "other" category is meant for actions that reference justice-related terms or themes, but <u>do not</u> specify a target population anywhere within the action or reference populations outside of the seven defined above. If any of the following criteria appear in an action along with a target population (specified anywhere within the same action), the action should be classified using one of the above categories.
- When populations are identified outside of the seven described above, they should be noted (e.g., veterans, youth aging out of foster care, etc.).

    ○ Youth counts as OTHER as long as it is in a DEIJ context (needing specific resources, being underserved, aging out of foster care, etc.)

- General use of terms such as justice, vulnerable populations, underserved, and equitable with no other details relating to a specific population.
- General discussion of environmental justice (such as in the context of brownfield remediation), gentrification, or segregation without referencing a specific population currently harmed or sought to benefit from the action.
- Use of the term diversity in the context of human populations either as an acknowledgement or seeking to increase it, and so on, without specifying a population or demographic.
- Minority groups are classified as "other" if no other information is given to specify which minority. If the term "minority" is included within the action but the action specifies which group (e.g., people of color, gender, etc.), the action should be classified as the population specified.
- Reference to (lower) literacy levels as barriers or resources for those with lower literacy levels (as related to education, for native English speakers). Includes low educational attainment, as long as it is in the context of providing resources/services for this population or acknowledging barriers, and so on.

Justice Frameworks

Each action can apply more than one justice framework. Each of these frameworks must be in the context or connected to one of the recognized populations described above or the "other category" (e.g., vulnerable or underserved communities, environmental justice, use of justice terms like equitably or inclusive, etc.).

Distributive Justice: (Access to or Provision of Services or Good)

- The "unequal distributions of impacts and/or responsibilities" (Agyeman et al., 2016).
- Relating to the distribution of goods and services. Ensuring that new or existing services or resources are distributed or accessible in an equitable manner. Includes providing services to previously excluded communities or communities that had limited access.
- Temporal or spatial distribution of access, hazards, benefits, and so on.
- Equitable access to clean air, water, health care, healthy environments/living spaces.
- While coding, it is best to write down distributive inequity OF WHAT: food, energy, water, land, brownfields, housing/shelter, and so on, as it will be helpful for future analysis.

- Providing resources to companies; organizations/agencies can count as distributive equity, as long as they directly improve access to services for a recognized population.
- Planning about providing services or increasing access does not count because planning is an intermediate step, unless it includes language about distribution of services, and so on.
- The distribution of information only does not count. Distributive justice is about the provision of services or programs and HOW the information is distributed. If the action describes how the information will be shared equitably, then it counts as distributive (otherwise, it counts as just enhancing capability).
- Collecting data and analyzing data on different distributive inequities counts as distributive equity. Especially a discussion of breaking down data by neighborhood, racial groups, and so on.
- Distributive justice is about the distribution of benefits and risks. If the actions are talking about equitable distribution of services, food, water, power services, it is distributive equity (there is a comparison here). However, if the actions are only seeking to build disadvantaged communities and building capacity, the action counts as community capability.

Procedural Justice: (Process: Including Communities in the Process and Changing the Process to Be More Equitable)

- "Inclusion in participation and procedure" (Agyeman et al., 2016).
- Does the action engage each of the recognized populations within the actions, are they part/included in preparing the plan? Includes outreach and engagement.
- Relating to the *processes* by which resources are distributed, organizational change, policy change. Includes actions that aim to give people a voice (if explicitly naming the populations described above).
- Removing barriers to participation, participatory justice, ensuring "seats at the table."
- Includes changes to laws, regulations, policies, and standard procedures to make them more equitable. However, these laws/regulations/policies must be about equitable inclusion in their design or about improving justice.

    - For example, removing disclosure requirements for formerly incarcerated individuals when applying for jobs.

- Fairness in decision-making.
- Inclusivity, transparency, public deliberation: Information and language access.
- Participation (inclusivity), were the communities engaged in developing the action or will they be engaged in implementing the action?
- Getting individuals/communities (bottom up) involved in higher level (city/state/programmatic) decision-making—efforts to promote justice bottom-up perspectives.
- Does not include planning efforts unless it includes the target populations in the drafting/writing of the plan. OR changing a procedure/process.
- Distribution of funding does not count (this would be distributive justice), unless the action includes how target communities will be involved in deciding where the funding goes.

Capability Approach: (Offered Things) This category was not quantified. The following criteria were created to provide loose framework for qualitative commentary. Future research is required to quantify such a multidimensional concept.

- Efforts to train communities (job training).
- Incorporating the needs, shared values of communities and responding appropriately.

- Promoting capability for communal well-being, such as via a ground-up approach.
- Social cohesion, which includes eliminating disrespect, insults, and degradation between/among populations/communities/individuals.
- May include certain citizen science approaches and the inclusion of local knowledge.
- Enhancing community/individual ability to continue improving their situation. Providing services with the goal that the populations won't need them again in the future because they are now better off.
- *Offered* programs count as enhancing community capability if it is catered toward addressing the most disadvantaged. (In contrast, procedural justice is when the communities are involved in program development, such as through a public deliberation process.)
- This includes actions that improve community well-being (overall) of vulnerable communities.
- EXAMPLES:

    - San Francisco Initiative 1.4: Expand Access to Health Facilities and Services for Our Most in Need—this counts as enhancing community capabilities because it is primarily in terms of increasing services at homeless shelters.
    - Increasing housing affordability—developers having more affordable units.
    - Actions related to promoting or increasing use of women- and minority-owned business enterprises (WMBEs).
    - Honolulu Action 35: Increase Coordination with Neighborhood Emergency Preparedness Groups, which included an element about distributing donations and working with local groups to make sure they get to groups at the neighborhood level. This is addressing community capability in environmental or health emergencies. In general, most programs are focused on addressing community capabilities, but they must be particularly taking into account the needs of low-income, Black, Indigenous, and disabled communities.

If there is not enough information to assign a justice framework, record "not enough information" for the action.

Justice Resilience Index

There are a possible four points per action. Points are assigned for each category for explicit inclusion of the criteria. Inferred use of the criteria does not count.

Focus

Primary Focus. Primary focus is if justice is the central core or focus of the action. First, look at the title of the action. If justice is included within the title, it is often the primary focus of the action. However, if justice-related terms are in the title, but not consistently throughout the action itself, it counts as partial focus. Be aware that while shorter actions may only have one reference to a population, the sole purpose of the action may still be to serve that one population, and therefore the action will be primary focus. For example, the Fresh Food Retailer action in the New Orleans resilience plan references low-income communities once, but the sole purpose of the action is to provide access to fresh foods to this community.

Partial Focus. If justice is not included within the title and is not included consistently throughout the description of the action but occurs more often than a one-word mention (e.g., occurring twice in multiple paragraphs or parts of the action), it is considered a partial focus.

Mention.   If justice is included within the action as a single word or short phrase, it is considered a mention (e.g., just referencing vulnerable populations, equity, or underserved populations).

- 0 pt = justice not included within the action at all
- 1 pt = the action has primary focus on justice

Justification

A justification is defined as a statement describing a justice-related issue within the action without describing implementation. This is often a preamble leading into a description of what the city plans to do to combat the challenge being described.

- 0 pt = no purely descriptive text
- 1 pt = the action describes a justice-related topic as a statement of fact, not offering an action related to it

Justice Frameworks

The criteria for each justice framework are provided above in the section titled "Justice Frameworks."

- 0 pt = no true justice framework or use of either distributive or procedural equity, but not both
- 1 pt = 1 point for included both distributive and procedural equity in the action

Recognized Populations

Does the action identify specific populations?

- 0 pt = no specific population identified (e.g., generic use of terms such as equity, vulnerable communities, or inclusive governance)
- 1 pt = specific population identified (including specific "other" populations outside of the main seven population categories: socioeconomic status, race, ability, gender, culture/language proficiency, immigrant/refugee, and those impacted by policing)