Implementing just climate adaptation policy: An analysis of recognition, framing, and advocacy coalitions in Boston, U.S.A.

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Cities face intersectional challenges implementing climate adaptation policy. This research contributes to scholarship dedicated to understanding how policy implementation affects socially vulnerable groups, with the overarching goal of promoting justice and equity in climate policy implementation. We apply a novel framework that integrates social justice theory and the advocacy coalition framework to incrementally assess just climate adaptation in Boston, Massachusetts in the United States. Boston made an ambitious commitment to address equity as part of its climate planning and implementation efforts. In this paper, we evaluate the first implementation stage over the period 2016−2019 during which Boston developed coastal resilience plans for three neighborhoods. Despite Boston's commitment to equity, we find injustice was nevertheless reproduced through representation and coalition dynamics, the framing of problems and solutions, and a failure to recognize the priorities and lived experiences of city residents. The assessment framework presented can be adapted to evaluate how other climate adaptation initiatives advance social justice and highlights the need for incremental evaluation over short time periods to inform ongoing implementation efforts.

KEYWORDS

just climate adaptation, Advocacy Coalition Framework (ACF), social justice, climate policy, Climate Ready Boston, public policy implementation

Introduction

The simultaneous climate, COVID-19, racial injustice, and economic crises demonstrate the intersectional, syndemic nature of public policy challenges and the risks of reinforcing existing vulnerabilities among already disadvantaged populations. There is an urgent need to adapt to climate change paired with a moral imperative to identify mechanisms that contribute to just and equitable adaptation outcomes for those affected most by climate impacts. In response to these needs, climate adaptation research increasingly includes an explicit focus on social justice in climate adaptation, on identifying systemic causes of social vulnerability, and on just adaptation. We define just adaptation as a process of systematically removing institutional barriers that disproportionately burden some groups of people more than others, while simultaneously creating opportunity and reducing harm related to climate change (Schlosberg, 2012; Anguelovski et al., 2016; Shi et al., 2016; Holland, 2017; Malloy and Ashcraft, 2020). We find, however, that scholarly attention to just adaptation has predominantly focused on how adaptation planning processes account for concepts of justice (Anguelovski et al., 2016; Chu and Cannon, 2021) and often fail to prioritize adaptation strategies or provide sufficient guidance on implementation (Woodruff and Stults, 2016; Olazabal et al., 2019; Turek-Hankins et al., 2021). In this paper, we build on this critical body of research about *what is needed* for just adaptation, to develop a research approach for *how to evaluate* the implementation of socially just climate adaptation policy. We apply this methodology in three urban neighborhoods in Boston, U.S.A., East Boston, Charlestown, and South Boston, where equity is an explicit goal of implementing climate adaptation policy.

Research design and methodology

A goal of this research was to respond to the need for clearer guidance for researching implementation (Hupe, 2014) by advancing a methodology that can provide insights to inform ongoing efforts. Our approach responds to the evaluation challenges of identifying stages or decision points in the implementation process to assess (Pressman and Wildavsky, 1984) and of identifying metrics that can be observed to evaluate successful implementation. We therefore begin by identifying generalized stages that, based on our experience with climate adaptation projects, can be commonly identified in initial project implementation, including in Climate Ready Boston. These initial stages typically occur over a relatively short time frame, which is appropriate for evaluating whether social justice is being integrated in climate policy implementation to inform ongoing efforts through an adaptive approach (Malloy and Ashcraft, 2020). Applying a framework that integrates social justice into

FIGURE 1
Common stages of a just climate adaptation policy implementation process.
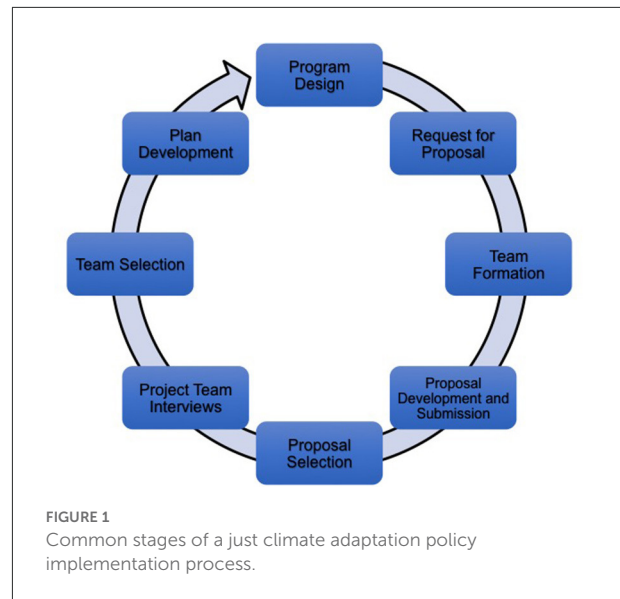
elements of the Advocacy Coalition Framework (ACF) to center equity and justice as explicit goals of actors implementing climate adaptation policy, we then identify key variables, observable metrics, units of observation and possible data sources evaluators can use to assess whether and how social justice is being implemented in climate adaptation implementation processes. We apply the approach to a case study of climate policy in Boston, focusing on the plan development stage. While all processes are different, the approach we present is intended to provide a starting point for evaluators to develop further, adapt, and apply to evaluate integration of social justice in other climate adaptation initiatives.

Common implementation stages of climate adaptation policy

Pressman and Wildavsky's (1984) chain metaphor represents policy implementation as a series of interconnected, or linked, decision-points, each of which introduces new actors, decisions, or processes that ultimately influence the outcome of stated policy goals. Figure 1 identifies common decision points in the public bid and implementation process which, based on our analysis, typically occur when a public entity secures funding to implement a policy and contracts with consultants to carry out various project tasks, such as data collection and analysis, engineering design, community engagement, and report preparation. Below, we describe what we would expect to observe at each policy decision point if socially just climate adaptation is integrated into implementation.

Program Design: A policy is developed by a public entity, which aims to achieve its goals through a series of projects (also called programs). Institutional norms related to social justice influence the development of the adaptation policy.

Request for Proposal (RFP): The public entity outlines the project goals, including social justice and equity goals, and solicits the development of proposals from potential consultants.

Team Formation: Project teams are formed, consisting of several public, private, and academic entities and including just adaptation stakeholders and partnerships, whose skill set collectively meets the RFP's objectives.

Proposal Development and Submission: Project teams develop and then submit to the public entity written proposals outlining how they intend to meet the objectives of the RFP, including social justice and equity goals, and present a project timeline, a qualifications package, and the cost of project work.

Proposal Selection: The public entity reviews project proposals based on an established set of project criteria, which include proposal completeness, including capacity to meet social justice and equity goals, project team qualifications, and proposed cost to conduct the project. The public entity selects a few "short-listed" project teams they consider best suited to completing the project.

Project Team Interview: The public entity invites "short-listed" project teams to present their project approach and qualifications in an interview-style setting, which often includes responses to provided interview questions or topics to address that explicitly align with the goals and objectives of the project, including social justice and equity goals.

Team Selection: The public entity selects a "winning team" based on the project criteria. Legal processes occur, such as the drafting of contract documents, negotiations over price, and the identification of potential conflicts of interest.

Plan Development: The project team conducts the work as agreed upon, which include public engagement and planning processes.

Unfortunately for policy evaluation, data about the implementation stages from team formation through team selection are often not publicly available. In fact, transparency emerges as one way a climate adaptation implementation process can demonstrate its commitment to just adaptation, for example by making submitted proposals, proposal evaluation criteria, and other key documents publicly available. Out of necessity because of the availability of data, this research focuses on evaluating the plan development stage. In comparison to other stages in which the public entity is the primary actor, plan development is an appropriate implementation stage for our analysis because a range of stakeholders are active, and their coalition dynamics can be analyzed. If information were available, team formation would be another appropriate implementation stage in which to evaluate coalition dynamics.

Observable metrics for evaluating just adaptation

This research focuses on three key requirements for implementing just adaptation policy, which were identified through the first synthesis of the ACF with elements of social justice theory to understand just climate adaptation (Malloy and Ashcraft, 2020). The ACF is a commonly used framework for analyzing public policy choices that centers the role of coalitions and political contestation and is well suited to understanding climate change policy choices (Sabatier and Mazmanian, 1980; Jenkins-Smith et al., 2017; Gabehart et al., 2022). Integrating elements of social justice theory with the ACF advances emerging research into how the framework can be used to understand the normative dynamics of climate change politics (Gabehart et al., 2022) and, importantly, centers equity and justice as explicit goals of implementing climate adaptation policy.

First, just adaptation requires that socially vulnerable people are represented in decision processes and have agency over the decisions that affect them. Based on the definition used in climate adaptation and racial equity planning in Boston (Martin, 2015; COB, 2016a, 2017a), we define social vulnerability to include people at susceptible life stages (e.g., pregnant women, elderly, children), people with existing health conditions (e.g., chronic disease, disability), occupationally exposed people (e.g., lack of access to safe jobs, language barriers, or transportation to employment), people disadvantaged by race, ethnicity, socio-economic status, and people living in vulnerable locations. Policy actors can be identified by their participation in advocacy coalitions, alliances held together by shared beliefs about desirable policy goals (Weible and Ingold, 2018), such as whether the goals of climate adaptation policy should be resilience, equity, or transformation (Malloy and Ashcraft, 2020). Coalition participants aim to use their varying sources of power and financial resources to establish institutional rules, resource allocations, and influence the outcomes of government policy and programs (Sewell, 2005). Coalition participants can be identified in a variety of ways, including actors with authority to make policy decisions, actors who influence policy decisions, actors known to be influential in a policy subsystem, and latent actors who often include disadvantaged populations who are threatened by or the target of policy and may not be mobilized. Importantly for this research, coalitions can exclude other actors from the policy process. Individuals typically participate through their affiliation with an organization and may be more constant or sporadic participants in advocacy coalitions (Weible and Ingold, 2018). Common policy actors in climate policy include city officials, consultants from the private sector, academia, and non-profit organizations, funding agencies, civil society groups, regional utility providers, and private sector business leaders. Once identified, advocacy coalitions can then be broadly

distinguished as for or against change by analyzing their core beliefs, organizational missions, and strategic interactions (Weible and Ingold, 2018). Because both representation and agency are critical for evaluating just adaptation, this research applied elements of the ACF to focus on identifying whether policy actors who advocate for social justice and representatives of socially vulnerable stakeholder groups are represented in the membership and leadership positions of decision bodies to make project decisions and influence public outcomes, including project teams and steering committees created by public entities.

Second, just adaptation efforts frame adaptation as transformation by explicitly identifying causes of systemic injustice and developing solutions aimed at addressing these causes. Framing is the process by which stakeholders contest, shape, focus, organize, construct, and represent interpretations of the world (Chong and Druckman, 2007). How coalition participants frame adaptation efforts reflects their beliefs about what should be the goals of climate adaptation policy. In addition to transformation, common framings of climate adaptation are resilience, which frames the goal of adaptation as functional persistence (Davoudi, 2012), and equity, which frames the goal of adaptation as distribution of costs and benefits (Hughes, 2013; Doppelt, 2017; Malloy and Ashcraft, 2020). Analyzing framing provides insight into whether coalition participants express goals that focus on causes of injustice and whether adaptation efforts maintain a focus on advancing justice. Climate adaptation projects often document information about how different stakeholders view problems and solutions, for example through records of comments at public participation opportunities or reports synthesizing participants' comments about problems and solutions.

Third, just adaptation efforts recognize the priorities and needs of socially vulnerable groups, develop the capabilities of just adaptation stakeholder groups to engage, and are perceived as just by socially vulnerable groups. Building the capabilities of socially vulnerable groups to exert agency in climate adaptation processes, in turn, influences who is represented in advocacy coalitions (Nussbaum, 2011). Evaluating recognition provides insight into whether participation by advocacy coalitions focused on social justice has an impact on outcomes. Recognition can be evaluated by analyzing whether project documents, such as project objectives and evaluation criteria, reflect the framing of adaptation efforts, priorities, and needs of socially vulnerable groups (Chong and Druckman, 2007), whether public engagement opportunities are designed to shape project development or only to educate the public (Shi et al., 2016), whether project resources are allocated to foster full participation of socially vulnerable groups, and by how socially vulnerable individuals perceive the implementation process.

Based on the three criteria, we defined observable metrics and units of observation by which to evaluate just adaptation efforts and identified possible sources of information (Table 1).

Case study: Climate Ready Boston

This research used a qualitative case study design to evaluate the City of Boston's ongoing climate adaptation initiative, Climate Ready Boston (CRB), which has an explicit commitment to foster equity. Metropolitan spaces are well suited to just adaptation research as they reflect contested governance between diverse public and private sector interests spread over broad geographies of interconnected and urgent public policy issues, including social justice, transportation, food, affordable housing, environmental issues, and economic development. Boston joined other U.S. urban areas in developing an ambitious climate adaptation initiative to respond to the intersectional challenges of climate change impacts from extreme heat, sea level rise, precipitation and storm events and social justice issues (COB, 2016a). Residential segregation, economic inequality, gentrification, and other forms of systemic racism have made Boston one of the most inequitable cities in the U.S., which is reflected in the City's landscape and vulnerabilities (COB, 2018). As a result, like many other coastal cities around the world, Boston is experiencing rapid rates of development in areas highly vulnerable to the effects of climate change (Shi, 2020; Shi and Varuzzo, 2020).

After a near miss from Hurricane Sandy in 2012, Boston Mayor Menino's administration established CRB as a joint initiative with the City of Boston and the Green Ribbon Commission, an existing commission focused on climate mitigation and, later, adaptation. According to CRB's citywide RFP (COB, 2015), CRB aimed "to prioritize initiatives that weigh stakeholder input, feasibility, scalability, adaptability, demonstrated effectiveness, climate mitigation contributions, co-benefits (e.g., job creation, green space, regional impacts), resilience and other factors" (COB, 2016b). By 2016, CRB was developing a citywide vulnerability assessment (VA) at the same time as Boston was engaged in Imagine Boston, the first citywide master planning effort in 50 years, and Resilient Boston: an Equitable and Connected City, a racial equity resilience plan to guide Boston to a more affordable, equitable, connected and resilient future (COB, 2017a,b).

CRB focused on three major climate hazards: extreme heat, stormwater flooding, and coastal and riverine flooding and included robust coastal flood risk modeling (Bosma et al., 2015) to analyze flooding impacts on people, buildings, infrastructure and the economy, such as economic loss or percent land area impacted, and included analysis of impacts on categories of socially vulnerable groups in the City. Preliminary vulnerability assessments in each Boston neighborhood were then refined through neighborhood-scale resilience planning efforts. As shown in Figure 2, following the CRB VA, implementation moved forward with the selection of the first neighborhood-scale resilience planning efforts: East Boston, Charlestown, and South Boston. East Boston and Charlestown were combined into a single planning effort. The first implementation stage

TABLE 1 Variables, observable metrics, units of observation, and potential data sources for just adaptation evaluation.

Variable: Observable metrics	Units of observation	Potential data sources
Advocacy coalitions: Policy actors who participate in decision-making	Representation (presence or absence) of just adaptation coalition actors (actors who advocate for social justice and representatives of socially vulnerable stakeholder groups) in the membership and leadership positions of decision bodies Interactions between adaptation coalition and just adaptation coalition actors	Project team information in proposals; Committee membership information in project reports; Lists of participants in RFP decisions in decision summaries; Interviews with project participants and interested and affected parties; Participant observation at project events; News and media reports identifying participants in decision bodies or key project events
Framings: Definitions of problems and solutions	Information about how just adaptation coalition actors define project problems and solutions	Infographics, documentation of public comments, and other public engagement information included in project reports; Interviews with project participants and interested and affected parties; Participant observation in public engagement events; Stakeholder statements in news and media reports about project objectives and solutions
Recognition: Framings in project elements (e.g., project objectives, evaluation criteria) Capabilities Perceptions of the implementation process	Inclusion of just adaptation coalition actors' framings and priorities in project goals and evaluation criteria; Design and purpose of public engagement to influence project development and outcomes; Resources to foster robust engagement of just adaptation coalition actors; Perceived just adaptation by just adaptation coalition actors	Statements of project objectives, evaluation criteria and their use in analyses; Public engagement goals and methods, and use of public knowledge and input in RFP; Project team proposals, interim and final reports; Allocation of budget and capacity building resources to support participation; Interviews with project participants and interested and affected parties

then advanced quickly from RFPs and proposal selection, the development of evaluation frameworks, and public engagement to the development of conceptual resilience design strategies (also known as a 30% conceptual design level), which typically include visual renderings but only limited engineering criteria. This research, conducted from 2016 to 2020, focuses on the initial implementation stage in the first two resilience planning efforts for the three selected neighborhoods.

Starting with the approach described in Table 1, we identified and analyzed publicly available data sources:

- Climate Ready Boston's final report, the vulnerability assessment for the City of Boston
- CRB Request for Proposals (2): the RFP for Charlestown and East Boston and the RFP for South Boston
- Consultant team proposal: the winning consultant team proposal for South Boston was the only publicly available proposal
- Neighborhood scale coastal resilience plans (2): the Charlestown and East Boston Adaptation Plan and the South Boston Adaptation Plan
- CRB media, including news sources, emailed newsletters, infographics and documents used to communicate online survey and public engagement outcomes

- Imagine Boston 2030, the master planning document for the City of Boston
-] Resilient Boston: an Equitable and Connected City, the racial equity plan for the City of Boston

We also conducted 18 semi-structured interviews between March 2019 and September 2020 (after neighborhood-scale coastal resilience plans were published) with representatives from city government, the non-profit sector, neighborhood organizations, the private sector, and academia. Interviewees were identified through purposive snowball sampling, beginning with stakeholders identified in CRB reports, digital media, recorded public informational sessions, and public meeting transcripts. Transcripts of recorded interviews were analyzed using NVivo software and a codebook, which was based on Table 1, developed through an iterative, hybrid inductive and deductive approach, and improved through intercoder reliability testing (see Malloy, 2021 for additional details on the interview and analysis process, the codebook, and interview protocol). Data were also collected through participant observation of citywide climate events focused on CRB and one South Boston open house event. Data involving human subjects were collected in accordance with UNH Institutional Review Board Approval #7068.
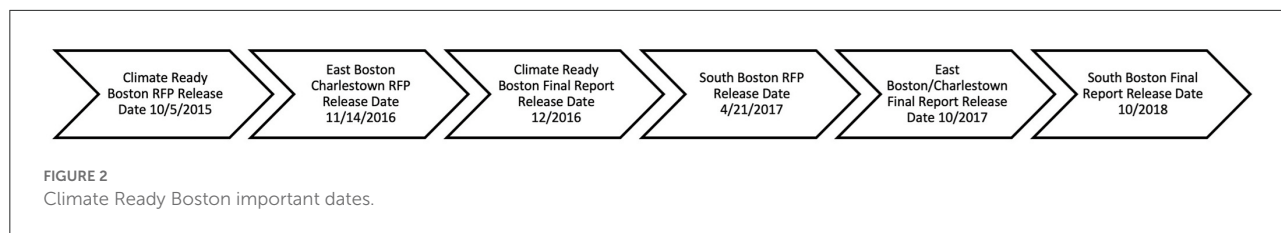
FIGURE 2
Climate Ready Boston important dates.

Results

Advocacy coalitions: Representation of just adaptation coalition on CRB decision bodies

Among the many interested and affected parties engaged in implementing Boston's climate resilience plan, we identified two distinct advocacy coalitions: the "adaptation coalition" and "the just adaptation coalition". The adaptation coalition included municipal leaders representing powerful interests throughout Boston and private sector consultant teams with expertise in modeling complex climate conditions and developing comprehensive planning documents. Although formally responsible for implementing policy, municipal leaders relied heavily on the well-resourced consultants, with whom municipal leaders often had long-standing relationships. The just adaptation coalition included actors representing neighborhood organizations, community advocacy groups, and project funding partners loosely allied through a shared focus on social justice and a framing of the goal of climate adaptation as transformation. Just adaptation coalition participants were engaged in policy issues at the intersection of climate change and social justice, issues which have historically been addressed separately. For example, community groups in East Boston, a neighborhood that has seen decades of economic stagnation and development pressures related to Logan Airport, were focused on affordable housing or reliable transportation, and integrated climate adaptation in their work as a subset of these goals. In contrast to the adaptation coalition, just adaptation coalition participants operated in a more decentralized way and had fewer resources, including financial resources, time, technology, and access to media and political leadership. The coalition also included less mobilized actors from socially vulnerable groups, who are the target of CRB policy and participated in public engagement opportunities. While both coalitions can be considered advocates for climate adaptation policy, their framing of policy goals differed (discussed in the section on framing climate adaptation). In this section we analyze whether just adaptation coalition participants were represented in the membership and leadership positions of two kinds of decision bodies: the neighborhood Steering Committees and the Infrastructure Coordination Committee, which was proposed but never created.

TABLE 2 Organizations participating on CRB steering committees (Sources: COB, 2016a, 2017c, 2018).

Climate Ready Boston Vulnerability Assessment	
Boston Environment Department	Boston Planning and Development Agency
MA Office of Coastal Zone Management	Boston Green Ribbon Commission
East Boston and Charlestown Resilience Plan	
Boston Environment Department	Boston Planning and Development Agency
Boston Parks and Recreation Department	Boston Public Works Department
Boston Transportation Department	Imagine Boston 2030
Boston Water and Sewer Commission	Boston Green Ribbon Commission
Mayor's Office of Neighborhood Services	Mayor's Office of Resilience and Racial Equity
Neighborhood of Affordable Housing (NOAH)	UMass Boston School for the Environment
City of Cambridge	City of Somerville
MA Office of Coastal Zone Management	MA Port Authority
MA Department of Transportation	
South Boston Resilience Plan	
Boston Environment Department	Boston Planning and Development Agency
MA Office of Coastal Zone Management	Boston Green Ribbon Commission

Each neighborhood initiative had a Steering Committee, which was largely responsible for implementing CRB. For example, South Boston project's RFP described the Steering Committee's leadership role in decisions, "the project will be under the direction of the Steering Committee" and "the consultant team should vet identified options with the Steering Committee and interviewed stakeholders before proceeding to community engagement" (SB RFP). Table 2 depicts the organizations represented on the Steering Committees for the first two planning efforts, as well as for CRB's VA.

A small group of organizations participated across each initiative and, as numerous interviewees pointed out, neighborhood-based social justice actors were largely absent from the Steering Committees. As one just adaptation coalition participant highlighted, "I think what is a challenge for that is most of the groups that are operating in the climate adaptation, climate resilience space are not organizations that are particularly racially diverse, don't particularly have any kind of racial justice analysis or tool to understand…" While advocates for racial justice and broader social justice exist, this quote highlights the separation between the policy spaces within which they and the adaptation coalition typically work.

The Neighborhood of Affordable Housing (NOAH) in East Boston stands out as a just adaptation coalition member that participated in a key decision body. NOAH is an East Boston-based non-profit organization focused on affordable housing initiatives and related programs. In recognition of NOAH's reputation in East Boston and dedication to climate preparedness efforts, the City of Boston specifically named NOAH as a Steering Committee member of the East Boston neighborhood planning project. The East Boston RFP called for the selected consultant team to partner with NOAH's ClimateCARE initiative to lead community engagement. However, in contrast to the consultant team, NOAH received no funding from the City for its implementation work. Despite NOAH's position on the Steering Committee, East Boston community advocates reported they felt NOAH was excluded from decision-making processes, had no opportunity to contribute to substantive project outcomes, and that NOAH's role in CRB's community engagement activities was limited to invitations to participate. This example illustrates why representation alone is insufficient for sustaining a focus on social justice in the implementation process.

The Infrastructure Coordination Committee (ICC) represents another missed opportunity for representation of just adaptation advocates. Developing the ICC emerged as a key recommendation of CRB's citywide VA to advance equity. During CRB's VA process, Boston residents identified access to transportation and communication networks as key concerns. An Infrastructure Advisory Group was formed with representatives from the water, sewer, transportation, energy, and telecommunication sectors. CRB's VA identified coordination of Boston's complex, interdependent infrastructure systems as an issue, noting that the City lacks "direct control over all of the infrastructure that serves its population and economy, relying partially on regional systems" (COB, 2016a, p. 118). The ICC was to be responsible for coordinating collaborative planning efforts across infrastructure system providers and for developing adaptation plans in accordance with design standards that "advance equity and protect socially vulnerable populations". According to CRB's final report, "The city should charge ICC members with paying particular attention to vulnerable populations who may be disproportionately impacted by full or partial infrastructure failure" (COB, 2016a). However, as of this writing, the City hasn't established the ICC. According to a City representative, the City still intends to form the ICC to support future CRB implementation, but its formation has been impeded by the lack of a framework for doing so. In the meantime, the absence of the ICC represents a missing space for advocacy coalitions to engage on a key concern identified by Boston residents.

CRB's neighborhood engagement efforts and recognition

In the earliest stages of CRB, Boston made a commitment to public engagement. CRB's community engagement strategies are summarized in Table 3.

Although CRB's citywide VA process involved limited community engagement, the process drew on data from the robust community engagement efforts that were part of the concurrent Imagine Boston 2030 and Resilient Boston initiatives (COB, 2017a,b). As the City shifted its focus from vulnerability assessment to neighborhood resilience planning in East Boston, Charlestown, and South Boston, the City expressed an explicit commitment to engaging the public and responding to community social justice needs. For example, according to the East Boston and Charlestown RFP

"*These coastal resilience strategies should be rooted in principles of adaptive design over time, nature-based storm damage protection techniques, community resilience, and coastal restoration and will be developed through a more extensive community engagement process to ensure the project addresses neighborhood needs and improves resiliency for multiple stakeholders…In particular, public engagement will aim to expand potential project co-benefits to issues such as equity, reduced social vulnerability, enhanced waterfront access, and economic development in areas directly flooded as well as those areas more indirectly impacted (such as by cascading impacts).*" (COB, 2016b).

During implementation, most CRB community engagement efforts were primarily structured to educate community participants, instead of to influence project outcomes. In open houses, project stakeholders from the City and project consultant teams provided information about project goals and proposed coastal resilience design solutions to the public through presentations and posters. Organizers used mostly one-way communication methods, such as surveys and voting, to solicit feedback on preferred site amenities and evaluation criteria. Data were then compiled into

TABLE 3 Summary of community engagement strategies.

Plan	Engagement date	Engagement approach
Climate Ready Boston Citywide Vulnerability Assessment	No Significant Engagement	Drew upon Imagine Boston 2030 and Resilient Boston Community Engagement Efforts
Climate Ready Boston East Boston and Charlestown Coastal Resilience Plan	East Boston Community Workshop (5/23/2017), East Boston Open House (7/13/2017), Charlestown Open House (7/20/2017)	Project team presentations Collect demographic information and open-ended feedback of interests and priorities Push-pin exercises Ranking of concerns and priorities Community resilience game
Climate Ready Boston South Boston Coastal Resilience Plan	Online Survey (9/28/2017–12/31/2017), Open House 1 (12/11/2017), Open House 2 (3/6/2018)	Project team presentations Collect demographic information and open-ended feedback of interests and priorities Push-pin exercises Ranking of concerns and priorities Tabling (i.e., attendance) at community events to promote project

infographics, which although not included in final project reports, are publicly available on the City of Boston's CRB website. Infographics characterizing engagement forum participants were limited to gender and identifying where participants were from. Community interviewees reported they felt the engagement forums could have fostered more inclusive participation, for example by better engaging local organizations. NOAH's ClimateCare program ultimately held a separate community engagement effort in East Boston and produced a climate preparedness planning document, funded through a $100,000 grant from the Kresge Foundation to support education and adaptation planning in low-income areas in East Boston. However, the CRB's consultant team did not include outcomes from NOAH's efforts in its final neighborhood report.

Project consultants reported that the engagement processes promoted knowledge about problems and solutions and identified education as one of the most valuable engagement outcomes. However, community advocates in East Boston viewed the approach to community engagement as outreach or education as a limiting top-down engagement method where already defined and framed projects were taken to the public for feedback. Just adaptation coalition participants said there were very few, if any, examples where participants' input directly changed the subsequent process or outcomes. They would have preferred a flipped approach that allowed for more dialogue and where community stakeholders were central to the decision-making and framing process from the beginning. Instead, many interviewees described consultants as the actors with the biggest impact on the content of the final reports.

Framing climate adaptation: Evaluation criteria and lived experience

During the neighborhood engagement opportunities, project teams made up of municipal stakeholders and consultant teams, asked participants to rate their most important evaluation criteria and provide feedback through open-ended questions or voting activities about their lived experience. Table 4 summarizes information provided by community engagement participants, which was included in final reports for the East Boston, Charlestown, and South Boston neighborhood-scale resilience planning efforts. Based on our review of online survey results and community engagement infographics, we found the final project reports accurately reflected participants' input, with one exception. Participants in South Boston ranked equity as the third most important evaluation criteria, but this was not included in the final project report.

While there are slight differences in the lived experience reported by participants across planning initiatives, the same general categories are apparent, including flood protection, affordable housing, access to transportation, access to open space and the waterfront. The similarities in how comments were reported from all three neighborhoods covered by the two initiatives suggest the project team's evaluation framework dominated the engagement approach and outcomes over the participants' contributions.

The City, Steering Committee and project consultant team developed the evaluation framework in response to a call in the East Boston and Charlestown RFP for the development of a "consistent evaluation framework guided by local priorities that consistently quantify the social, environmental, and

TABLE 4 Evaluation criteria and community feedback reported in CRB neighborhood-scale resilience planning final project reports[*].

Neighborhood	Evaluation criteria	Community feedback—lived experience
East Boston Charlestown	Effectiveness, Design life, Environmental impact, Social impact	Flood protection
		Mobility—safe and reliable transportation system
		Affordability—affordable housing and access to jobs
		Open Space—diversity of recreational and passive uses.
		Waterfront Access
South Boston[*]	Effectiveness, Environmental impact, Design life, Feasibility	Flood protection
		Affordable housing
		Parking access
		Protection of industrial areas
		Water dependent businesses
		Open space

[*]The South Boston final report left out equity, which participants ranked as the third most important evaluation criteria.

economic benefits of proposed resilience initiatives with particular attention to social equity and the needs of socially vulnerable populations" (COB, 2016b, p. 106). The framework evaluation criteria were effectiveness, feasibility, design life and adaptability, environmental benefits, social impact, equity, and value creation, and were to be used to help "guide and rank proposed climate resilience strategies" (COB, 2016a). CRB evaluated effectiveness based on maximum level of protection from coastal storm events, reduction in flood extents, avoided damage and loss, residents protected, and critical assets protected. CRB defined feasibility as stakeholder acceptance, constructability, permitting, affordability: cost of construction and maintenance, and replicability. A project decision-maker with the City described the framework as focused on reducing flooding over addressing other community concerns.

The purpose of developing consistent evaluation criteria was to serve more as a guiding principle, to better understand who is going to be affected by flood hazards and how to prioritize projects to protect the city, and less of a framework or evaluation tool to make strong decisions, such as issues surrounding green gentrification, housing, or ownership of vulnerable spaces.

While measures of feasibility and effectiveness provide useful information, and of course need to be considered when evaluating flood protection measures, other more innovative measures of social vulnerability were less represented or absent altogether from project outcomes. Many interviewees for this research described the solutions that were proposed following the neighborhood planning efforts as projects that respond to predefined flood pathways, which fit the criteria of feasibility and effectiveness, but also as projects that don't respond to community priorities and sources of vulnerability identified through the neighborhood planning processes. For example, the proposed solution for Charlestown was to raise a roadway along a defined flood pathway, which is a state transportation project that has been pending long before CRB began. An interviewee

commented that residents considered raising the roadway to be a limited solution to present day flood vulnerability that won't address persistent risks related to sea level rise and rising tides in residential neighborhoods. Similarly, an interviewee from the City described East Boston's proposed deployable flood barrier as a "shovel ready" project and as a cost effective and immediate measure to "protect everyone equally". In contrast, East Boston neighborhood residents and just adaptation advocates described the proposed solution as a missed opportunity to engage in dialogue, educate the community about ongoing climate resilience efforts in the city, and provide co-benefits for residents, such as improving access to safe and reliable transit options or affordable housing. Project teams prioritized effectiveness and feasibility over equity, social impact, or environmental benefit, which diminished the considerations of socially vulnerable groups and undermined the role of the engagement efforts. While an important outcome across the neighborhoods was improved access to open space and the waterfront, because this outcome already aligns well with flood protection measures, it doesn't represent a new framing that centers social issues. Instead, the adaptation coalition's framing of project goals as reducing flooding dominated just adaptation coalition members' more transformative framings.

In another example, the first neighborhood-scale RFP (issued 2 months before publication of Boston's vulnerability assessment) combined East Boston and Charlestown into a single planning initiative. The decision focused on the neighborhoods' similar climate risks, ignoring differences in their sociodemographic characteristics or priorities. As stated in the RFP, the decision was intended to "advance the development of interventions at two critical coastal flood pathways for the city" because these locations "are currently at risk from 1% annual chance of flooding, have high concentrations of vulnerable residents and critical infrastructure, and are affected by relatively narrow and well-defined flood pathways"

(COB, 2016b, 2017d). As a result, the final project report combined community engagement input from East Boston and Charlestown, which prevented community needs and sources of vulnerability specific to either neighborhood from informing project solutions. Table 5 summarizes our observations of how justice was not sustained during the first implementation stage.

Discussion

In this research we first identified two distinct coalitions defined by different framings of climate adaptation goals as resilience or transformation (Malloy and Ashcraft, 2020). Members of the adaptation coalition saw flood pathways as the main adaptation challenge to be addressed and technical criteria, especially effectiveness and feasibility, as primary considerations for evaluating projects. Adaptation coalition organizations coordinated their actions closely. They also had resources, including scientific and technical expertise, their own financial resources or funding from others, and access to political leadership, to support their implementation work. In contrast, we identified members of the just adaptation coalition based on participants' shared beliefs in transformation as an adaptation goal. They viewed flooding as only one part of the climate adaptation challenge, along with access to jobs, mobility, affordable housing, and open space, for example. They considered the extent to which projects provided co-benefits across interconnected issues as primary criteria for evaluating projects. Just adaptation coalition participants had fewer resources to support their implementation work, included latent members who mobilized only occasionally for policy action, and coordinated more loosely with one another to advance broader social justice goals.

Our analysis revealed three interrelated procedural features that reinforced reliance on technical and policy experts of the adaptation coalition to the detriment of socially vulnerable groups in the just adaptation coalition (Webster et al., 2022). First, we found CRB decisions tended to reinforce dominant coalition dynamics that favored elite interests and exacerbated power inequalities. CRB aimed to foster inclusive implementation by naming a just adaptation coalition actor, NOAH, to a decision-making group, by recommending that an important proposed infrastructure committee consider equity as a dominant feature in decision-making, and through community engagement forums that could provide opportunities for less mobilized just coalition actors to influence policy. However, steering committees lacked substantial representation from just adaptation coalition participants. Even with representation on the steering committee, NOAH, the primary participant representing socially vulnerable groups, received no funding for its implementation efforts and was relegated to a peripheral role. The Infrastructure Coordination Committee was never formed. As a result, we find that the

just adaptation coalition was largely excluded from influencing policy. Consistent with other research on urban adaptation planning, advocacy coalitions' competing interests and decision processes constrained the inclusiveness of adaptation efforts (Chu et al., 2017).

Community engagement is a common aspect of climate adaptation planning and is generally used as another mechanism to promote representation and equitable project outcomes. However, CRB community engagement opportunities were not well coordinated with neighborhood groups and there was little reporting on how robust participation in forums was from socially vulnerable groups, with the notable exception of participants' gender. Rather than structuring CRB public engagement as effective forums to inform policy, forums included few opportunities for dialogue and focused, instead, on "thin" one-way communication methods for outreach and education (Rowe and Frewer, 2000). Thin approaches to engagement have value, but struggle to engage under-represented groups, garner public trust, and shape organizational goals (Agyeman, 2013). As a result, open houses and public listening sessions are often criticized as merely checking a box so project teams can meet public contract requirement while advancing already defined project goals and proposed solution. As we saw in CRB, project team participants are typically already privileged, for example by being paid through municipal contracts, which risks delegitimizing outcomes from the perspective of less resourced actors, especially when social justice advocates are unpaid for their implementation work (Fung, 2006; Tschakert et al., 2013). Relying on subject matter technical expertise, such as modeling or cost-benefit analysis, is necessary and important for complex adaptation processes, but can dominate the stated needs of community residents or their representatives, as we found in CRB's implementation, risking the legitimacy of these processes (Few et al., 2007; Jasanoff, 2018). In a place like Boston, where there is a history of vulnerable groups being dominated by powerful stakeholders, an approach that centers technical experts over residents further erodes trust (Eriksen et al., 2015).

Finally, we found that the adaptation coalition's dominant framing of problems based on flood pathways and reliance on a technocratic evaluation framework favored pre-determined outcomes focused on flood mitigation designs that missed opportunities for co-benefits to address other priorities of the just adaptation coalition. The decision to combine East Boston and Charlestown in the first implementation project shows how framing the goal of adaptation as resilience trapped implementation decision-making in a science and policy focused framing implementation over social justice concerns. The decision to focus on feasibility and effectiveness was intended to support the development of district-scale flood mitigation strategies and establish a consistent evaluation framework through neighborhood scale implementation efforts. In doing so, it also pre-defined, and shifted, the planning

TABLE 5 Evaluation of just adaptation in Climate Ready Boston's first implementation stage.

Variables	Observations
Advocacy coalitions	Representation on steering committees: adaptation coalition participants dominated; Only one neighborhood just adaptation coalition participant (NOAH) participated, and its implementation work wasn't funded by CRB
	Infrastructure Coordination Committee wasn't formed
	Public engagement forums didn't partner with local organizations; Participation in forums from socially vulnerable individuals wasn't reported other than gender characteristics
Framings	Adaptation coalition problem framings (flood pathways) dominated just adaptation coalition priorities and lived experiences; East Boston and Charlestown neighborhoods were combined into a single project
	Framework developed by adaptation coalition dominated project evaluation over just adaptation coalition's interests in co-benefits; South Boston final report omitted equity as an evaluation criterion prioritized by engagement participants
Recognition	Public engagement forums were organized for outreach and education; One-way communication methods dominated engagement forums
	Consultants had primary influence on final reports; Input from public engagement forums had minimal influence
	East Boston and Charlestown final report excluded outcomes from engagement effort led by neighborhood just adaptation coalition participant (NOAH)

focus away from the priorities of the just adaptation coalition. Feasibility analysis, which includes measures of effectiveness, is a common approach in planning and engineering disciplines that establishes dominant criteria for assessing the viability of a land use development project. However, evaluation criteria that emphasize feasibility and effectiveness are very different decision-making tools, as compared to community feedback about lived experiences (Adger, 2016). While in practice, the use of a consistent evaluation framework may help to reconcile the too-many variables problem common in policy implementation (Pressman and Wildavsky, 1984), in CRB we see how this approach replaced the hard work necessary to engage with the just adaptation coalition in a manner that influenced project design (Adger et al., 2005). A dynamic approach is needed that reconciles evaluation criteria focused on project outcomes and contextual framings based on neighborhood social justice needs to support broader stakeholder representation and meaningful procedural justice (Van den Berg and Keenan, 2019).

Based on our review of the first three years of the implementation of Climate Ready Boston, we found that Boston's commitment to incorporate equity into neighborhood-scale planning was overshadowed by a traditional, mainstreamed approach to policy implementation that built on existing planning approaches, similar to what has been observed in other studies (Chu et al., 2017). Language in RFPs and other documents provide evidence of the city's commitment to a process rooted in concepts of procedural justice and recognition, which aimed to include considerations of social vulnerability, such as the cultural or symbolic value of what is being affected (Adger, 2016). However, consistent with other urban adaptation research, our analysis of the first stage of implementation found that decision-points in the implementation process reinforced unjust outcomes for

socially vulnerable people through mainstreamed planning processes (Uittenbroek et al., 2013; Van den Berg and Keenan, 2019).

Conclusions

As scholars increasingly pay attention to the implementation of climate adaptation policy, we argue that climate adaptation efforts must be evaluated on short, incremental timeframes in order to identify ways in which justice is or is not fostered during implementation. Planning efforts following a policy decision, such as the preparation of vulnerability assessments or resilience plans, should be evaluated as a fundamental early phase of policy implementation. Evaluation results can then inform rapid and ongoing implementation initiatives. For example, in comparison to the first stage of implementation that was the focus of this research, Boston's CRB efforts from 2019 to 2022 show the kinds of co-learning and improvements in fostering equity that an analysis of incremental implementation stages can inform. Boston's more recent CRB efforts have advanced the resilience of the city through five "layers" that address: (1) updating climate projections, (2) building community resilience, (3) protecting the shoreline, (4) constructing resilient infrastructure, and (5) adapting buildings to climate risk (COB, 2022a). Boston expanded its resilience planning focus by preparing district-scale resilience plans in Dorchester, the North End, Downtown, and East Boston—Phase 2, developed a citywide harbor vision, and an extreme heat plan (COB, 2022b). To support implementation efforts, the City also coordinated with the City Works Department and the Boston Planning and Development Agency (BDPA) to develop climate resilient design guidelines. Resilience planning in Dorchester fostered equity, for example, by shifting the emphasis in its

planning framework from feasibility and effectiveness to the stated needs of the community. Similarly, East Boston improved the accessibility of its project resources by making them available in multiple languages, which creates an opportunity for more people to provide input. In contrast to the first implementation phase, subsequent RFPs stated that proposals would be publicly available upon request, which is critical for transparency and evaluation. Efforts that aim to implement just climate adaptation should take similar steps to increase transparency by making information available about how social justice and equity goals are integrated in each stage of the implementation process.

As we found with CRB, merely embedding goals of equity into planning documents is insufficient to achieve transformation. The risk is that failing to focus on structural conditions of inequality, such as poverty or exclusion, allows vulnerability to persist under the guise of socially just climate adaptation and distracts from building adaptive capacities (Agyeman, 2013; Bulkeley et al., 2013). Our intent is not to blame any actor or initiative; even advocacy organizations with a focus on justice can be susceptible to engaging in mainstream adaptation planning over transformative adaptation planning (Shi, 2019, 2021). Similarly, our intent is not to propose unachievable implementation standards that thwart any kind of good intentions a city may have. Instead, we aimed to develop a research approach that can be used to evaluate whether social justice is integrated in incremental climate policy implementation efforts and to inform ongoing initiatives. A focus on just adaptation coalition building, centering framings of climate adaptation problems and solutions based on lived experience of disproportionately burdened people, and representation of socially vulnerable groups and recognition are critical to achieving socially just climate adaptation, as is a commitment to policy evaluation and co-learning.

Data availability statement

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by University of New Hampshire Institutional Review Board. The patients/participants provided their written informed consent to participate in this study.

Author contributions

Research conceptualization and methodology: JM and CA. Investigation and analysis: JM. JM developed the original draft with significant writing contributions from CA. All participated in revisions. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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