

APRIL 2020

Climate Change and Displacement in U.S. Communities

How Communities, Professionals, and Experts are Responding to Climate Change and Displacement



Cover Image: Denver, Alex Gray, [CC BY 3.0](#)

Acknowledgements

Authors

RACHEL M. GREGG & KATHRYN N. BRADDOCK

More Acknowledgements

Special thanks to:

- » The research team—Anna Cash, Naomi Cytron, Nicholas Depsky, Shazia Manji, and Marissa Ramirez—for input and guidance on the survey,
- » EcoAdapt staff and Nick Collins for formatting this paper,
- » and the numerous individuals who contributed materials and participated in interviews and surveys for this project.

This report was funded by the Strong, Prosperous, and Resilient Communities Challenge (SPARCC); the views contained herein are those of the authors and do not necessarily reflect those of SPARCC.

Recommended Citation

Gregg RM, Braddock KN. 2020. Climate Change and Displacement in U.S. Communities. EcoAdapt, Bainbridge Island, WA.

For more information about this report, please contact Rachel M. Gregg at Rachel@EcoAdapt.org.

TABLE OF CONTENTS

CLIMATE CHANGE AND DISPLACEMENT	4
Key Findings	4
Overview	5
Needs Assessment Survey Results	8
Respondents	9
Community Pressures	12
Knowledge, Products, and Services	18
Adaptation Motivations, Barriers, and Opportunities	20
 Anti-Displacement Activities That May Increase Community Vulnerability to Climate Change	 27
 Anti-Displacement Activities That May Increase Community Resilience to Climate Change	 29
Infrastructure and Development	29
Transportation	30
Policy	32
Capacity Building	34
 CASE STUDIES	 36
Case Study: Enterprise Community Partners	36
Case Study: Bay Area Regional Health Inequities Initiative	38
Case Study: The Greenlining Institute	41
Case Study: Partnership for Southern Equity	43
Case Study: Southface Institute	45

Key Findings

- » Eighty-eight percent of respondents indicate that their community is experiencing moderate to significant development or redevelopment pressure.
- » Ninety-one percent of participants agree that climate change is having or is likely to have a significant effect on their communities.
- » Day-to-day issues such as the availability of affordable housing, fair housing opportunities, rising property values, displacement risks, and cost of living rank highly among all respondents, followed by climate change stressors and impacts—storms and extreme weather events, extreme heat events, flooding, drought, sea level rise, and wildfire.
- » Of the climate issues ranked among those about which respondents are very concerned are storms and extreme weather events, extreme heat events, flooding, increasing air temperatures, sea level rise, drought, and wildfire. Among respondents from states engaged in the Strong, Prosperous, and Resilient Communities Challenge, wildfire only registers as a major issue of concern for western states such as Colorado and California. Flooding ranks as the most frequently expressed concern for respondents from Tennessee, while extreme heat events and storms are the most frequently expressed concerns by respondents in Georgia and Illinois.
- » Respondents most frequently use best practices, lessons learned from other professionals, knowledge of community members and peers, and environmental, climate, and/or economic justice and equity information to inform their work.
- » Sixty-four percent of survey respondents report adjusting their activities in some way to address climate change, and are primarily motivated by concerns about climate justice and equity, perceived threats from climate-related events, and observed changes in their community.
- » Key barriers to addressing displacement in a changing climate include lack of funding, insufficient staff resources and capacity, and current more pressing issues. Among the lowest perceived barriers are a lack of clarity about which adaptation options are available to decision makers and lack of specific climate data for communities.
- » Many of the anti-displacement activities expressed by respondents that may be vulnerable to the effects of climate change or may increase community vulnerability are related to maintaining the status quo as baseline problems contribute to community instability. Limitations in resources, economic and job opportunities, and access to critical services also amplify individual and community vulnerability to climate change. Maladaptive policies or practices also make communities more vulnerable to climate

change as they may increase risk to the impacts of climate change, increase greenhouse gas emissions that cause climate change, or otherwise negatively affect people's wellbeing.

- » Participants noted several opportunities to increase community resilience to climate change, such as integrating climate change into the design and building of new developments, investing in community revitalization and stabilization, improving and maintaining access to services during extreme events, stronger protections to promote tenant and housing stability, increased public education and engagement, investment in the workforce, and technical and financial assistance to improve climate resilience in vulnerable communities. Examples are provided from across the United States and full case studies are presented on projects from Enterprise Community Partners, Bay Area Health Inequities Initiative, the Greenlining Institute, the Partnership for Southern Equity, and the Southface Institute.

Overview

Climate change is playing a bigger role in determining where and how we live, and is limiting access to and availability of affordable healthy housing, healthy food choices, transportation choices, and social networks, which is forcing displacement of individuals and communities. Displacement—whether temporary or permanent, forced or voluntary—is an issue rooted in inequity and exacerbated by climate change. Climate change poses significant threats to the physical, cultural, spiritual, social, and economic displacement of communities around the world. It is also causing increasing mental and emotional distress or *solastalgia*—the loss of sense of place or identity.¹ In some cases, the improvements made to communities to help them adapt to climate change may exacerbate gentrification, leading to rising housing costs and rents and redevelopment, squeezing the most vulnerable communities into living conditions that are even less equipped to bounce back if a natural disaster were to occur.

As part of EcoAdapt's State of Adaptation Program,² we partnered with the Strong, Prosperous, and Resilient Communities Challenge (SPARCC) to conduct a survey to determine if and how people working to address displacement pressures are considering the effects of climate change. This survey is part of a broader project in collaboration with the Urban Displacement Project to better

¹ Albrecht G, Sartore GM, Connor L, Higginbotham N, Freeman S, Kelly B, Stain H, Tonna A, Pollard G. 2007. Solastalgia: the distress caused by environmental change. *Australasian Psychiatry* 15 Suppl 1(1):S95-8.

² EcoAdapt State of Adaptation Program: <http://ecoadapt.org/programs/state-of-adaptation>

understand the intersections between climate change and displacement pressures. Our objectives were to identify:

1. To what degree anti-displacement practitioners are thinking about climate change in their work;
2. Emerging practices and policies that may address the dual goals of reducing climate risks and displacement pressures; and
3. Needs, opportunities, and barriers in reducing climate risks and displacement pressures in communities.

Climate change is one of several factors influencing the potential displacement of individuals and communities (Figure 1; Table 1). Communities throughout the United States are increasingly subject to extreme heat, flooding, storms, wildfire, drought, and changes in water availability. These risks are not equally distributed across communities. The state of individual and community wellbeing depends on interactions between exposure to the physical environment, vulnerability to threats, and human adaptive capacity. The vulnerability of a community is influenced by various social determinants, such as race and ethnicity, age, gender, economic stability (e.g., cost of living, access to living wage), education, housing and transportation options, safe drinking water, and physical and economic access to critical services. For example, communities located in low-lying flood zones are inherently more at risk from flooding, storms, and sea level rise. The ability of individuals and/or communities to move or otherwise adjust in anticipation of or in response to stresses such as climate change and extreme weather events is also influenced by these social determinants. For those with economic means, moving beyond their place of residence is possible, but for many frontline communities, the only choice is to stay in place or move internally.

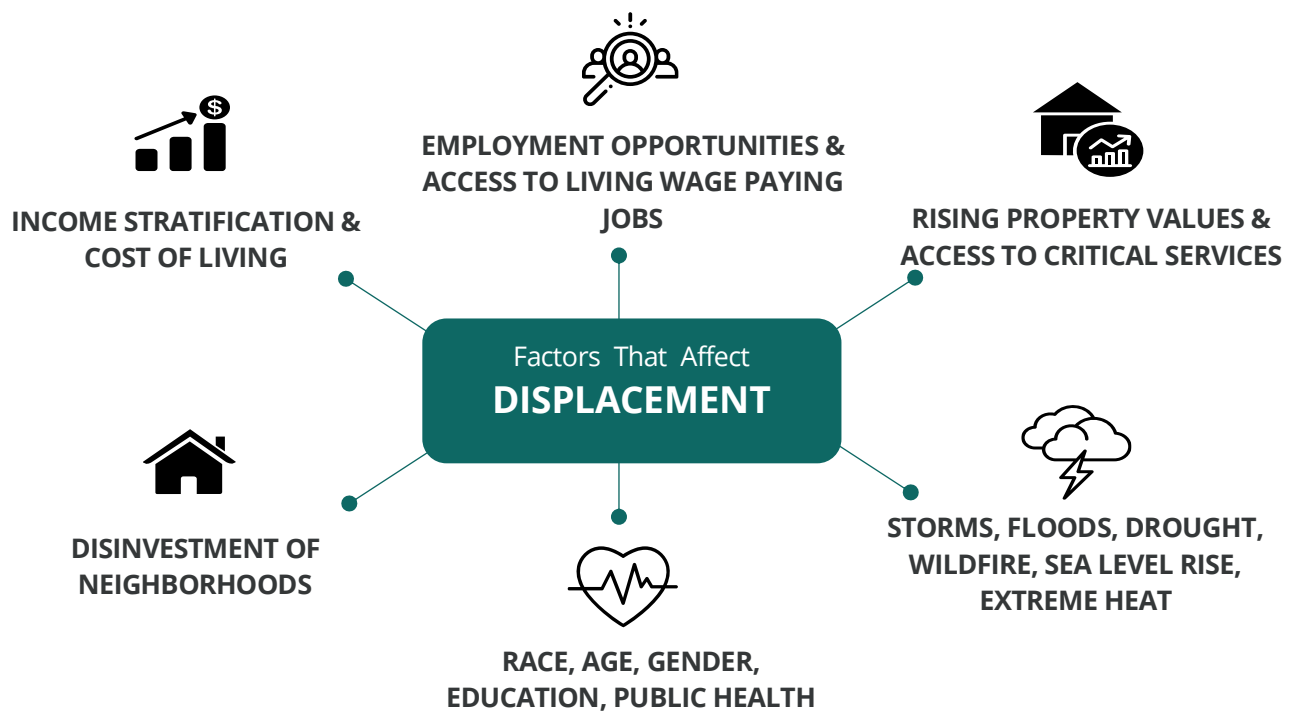


Figure 1. Factors influencing displacement of individuals and communities.

Table 1. Examples of climate stressors and social determinants that affect individuals and communities and their ability to adjust.

Climatic Drivers and Stressors	Social Determinants	Examples of Effects	Adaptive Options
<ul style="list-style-type: none"> » Increasing air temperatures and heat waves » Changes in precipitation amount and timing » Wildfire » Drought » Sea level rise » Frequency and severity of storms » Range shifts of pests » Flooding » Urban heat islands 	<ul style="list-style-type: none"> » Race and ethnicity » Age and gender » Economic stability (e.g., living wage) » Poverty » Housing and transit options » Education » Geographic location » Physical and economic access to critical services 	<ul style="list-style-type: none"> » Health (e.g., respiratory and cardiovascular illnesses, heat-related illnesses, emotional grief) » Safety (e.g., injuries and fatalities) » Displacement of individuals and communities » Food and water contamination » Food security issues (e.g., disruption in food supply chain due to inaccessible transportation routes) » Disruption or damage to critical services » Stress on energy systems that may lead to power outages » Stress on livelihoods (e.g., fishing and farming communities) » Cultural and spiritual disruption 	<ul style="list-style-type: none"> » Stay in place » Move internally within place of residence » Move beyond place of residence

Social factors influence a community's adaptive capacity or ability to prevent or recover from a disaster or climate-related event. The Centers for Disease Control and Prevention's Social Vulnerability Index (SVI) calculates the vulnerability of counties based on U.S. Census data and factors such as poverty and access to transportation and housing, grouped into four major themes—socioeconomic status (e.g., unemployment, income), household composition and disability (e.g., ages, disability status, single-parent households), minority status and language (e.g., race/ethnicity, English as a Second Language), and housing and transportation (e.g., no vehicle, mobile homes, crowding).³ Possible scores for the Index range from 0 (lowest vulnerability) to 1 (highest vulnerability). SVI data and maps can be used to better prepare for and respond to events by identifying the most at-risk communities, estimating supplies needed, and identifying emergency shelter needs. Among the SPARCC cities, there is a range of high (Memphis, Los Angeles), moderate

³ <https://svi.cdc.gov>

to high (Chicago, Atlanta), and low to moderate (Denver, Bay Area) levels of social vulnerability (Table 2).

Table 2. Social Vulnerability Index scores of SPARCC cities/counties. Possible scores range from 0 (lowest vulnerability) to 1 (highest vulnerability): High: 0.75–1, Moderate-High: 0.5–0.75, Low-Moderate: 0.25–0.5, Low: 0–0.25

County	Overall	Socioeconomic Status	Household Composition & Disability	Minority Status & Language	Housing & Transportation
Atlanta/Fulton & DeKalb Counties	0.6296 	0.4544 	0.1780 	0.9427 	0.7975
Chicago/Cook County	0.6937 	0.5304 	0.1223 	0.9631 	0.8742
City and County of Denver	0.4798 	0.3241 	0.028 	0.9386 	0.8774
Memphis/Shelby County	0.7896 	0.6425 	0.5839 	0.8594 	0.7462
Los Angeles County	0.7883 	0.6517 	0.1388 	0.9930 	0.8940
Bay Area Counties ⁴	0.4353 	0.2614 	0.0827 	0.9442 	0.74196

Needs Assessment Survey Results

In order to identify climate-informed anti-displacement activities underway in U.S. communities, we conducted an online survey and follow-up interviews. A unified set of questions were created and a coding scheme for answers was designed in order to make tracking and cross-referencing possible. The online survey used a structured approach with multiple choice options provided from which respondents could select. Survey responses were collected through SurveyMonkey, a web-based survey company, between July and October 2019 with 179 respondents from across the United

⁴ Presents averages of SVI scores for Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties. The highest overall social vulnerability scores are Solano (0.6511), Alameda (0.5164), and Santa Cruz (0.5148). The highest housing and transportation scores are for San Francisco (0.9443), Alameda (0.9112), and Santa Cruz (0.9039).

States. We also reached out directly to survey respondents who identified specific climate-informed anti-displacement initiatives from the Bay Area, Los Angeles, and Atlanta. Examples from these and other initiatives to address climate change are presented with the survey results.

RESPONDENTS

Respondents were asked to identify their position type, professional affiliation, and the sector(s) and state(s) in which they work. Respondents self-identified across a range of positions, including managers/coordinators (27%), executives (22%), policy analysts (17%), planners (16%), community organizers (16%), and scientists (12%) (Figure 2).

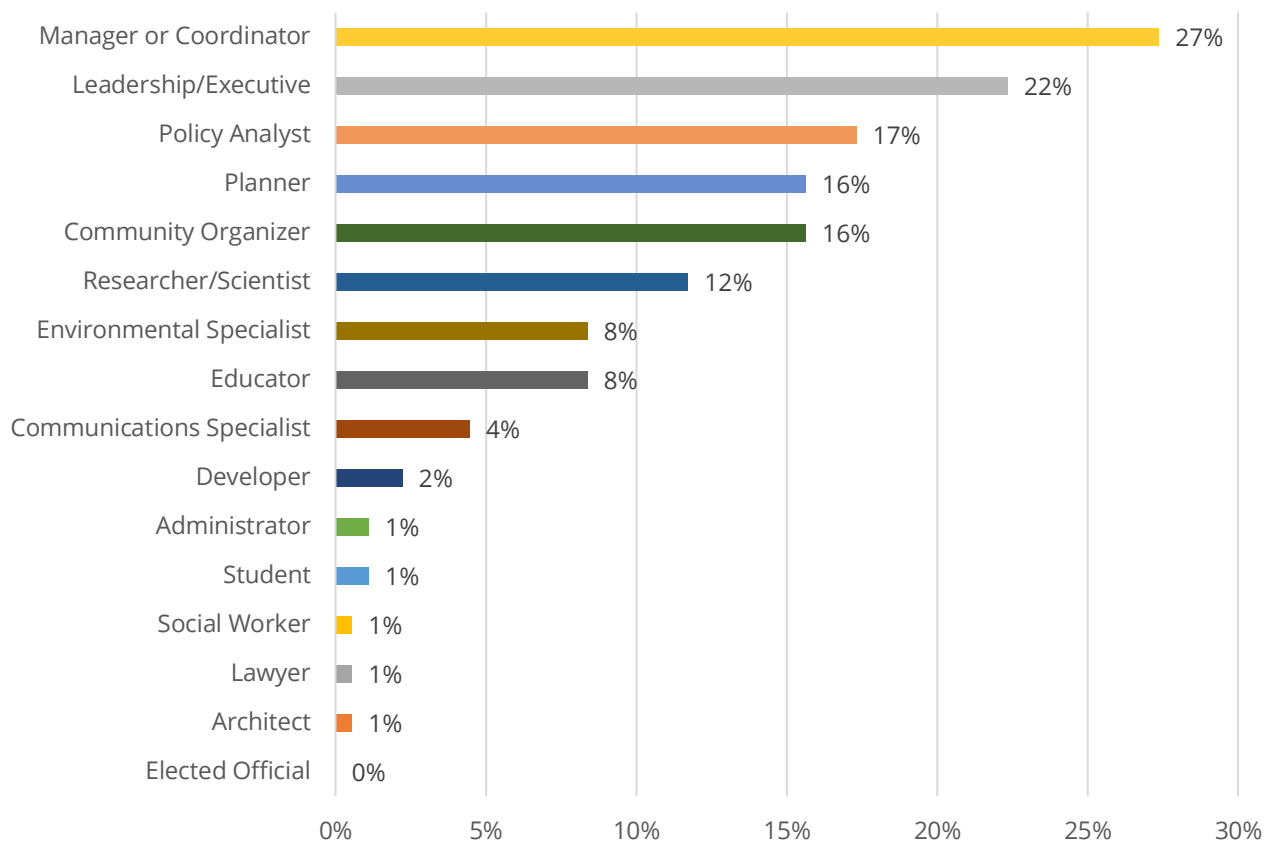


Figure 2. Position types of survey respondents (n=179).

The largest number of survey participants represent nongovernmental or community organizations (48%), followed by city government (21%), county government (9%), and tribal nations (6%). The lowest participation included federal and state government representatives (Figure 3).

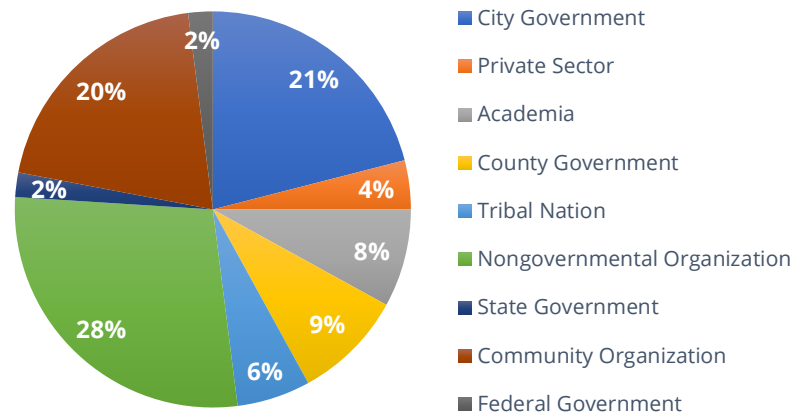


Figure 3. Professional affiliations of survey respondents (n=179).

Respondents primarily represent housing (51%), environmental and/or economic justice (40%), planning (39%), or policy (37%) sectors (Figure 4). The lowest participation included those representing engineering (4%), law (4%), and economic development and financing (3%).

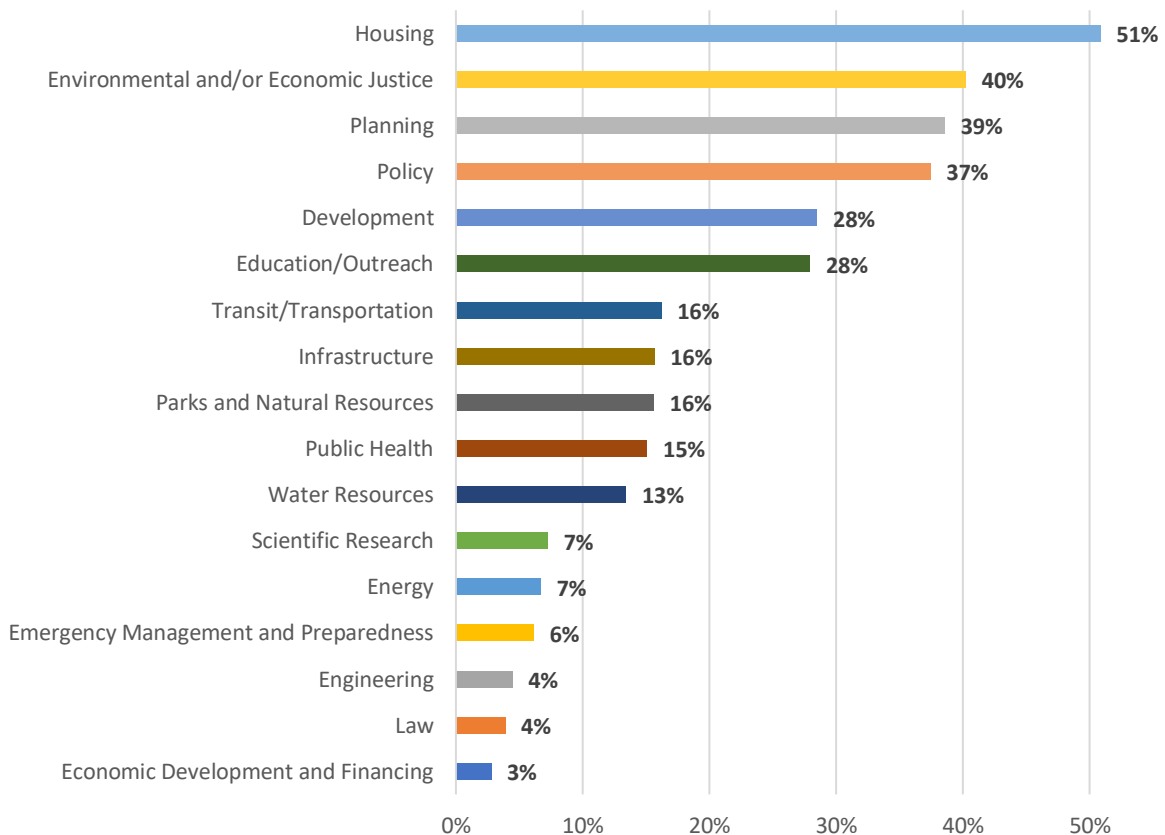


Figure 4. Professional affiliations of respondents (n=179).

Respondents were also asked to indicate the state(s) in which they work (Figure 5). Most respondents represent California (23%), Washington (12%), Florida (7%), and Illinois (7%). No responses were received from individuals in American Samoa, Arkansas, Delaware, Guam, Idaho, Iowa, Kansas, Maryland, Mississippi, Puerto Rico, Rhode Island, South Carolina, U.S. Virgin Islands, West Virginia, and Wyoming. Approximately 37% of respondents represent SPARCC states, including those from California (41), Colorado (3), Georgia (5), Illinois (12), and Tennessee (6).

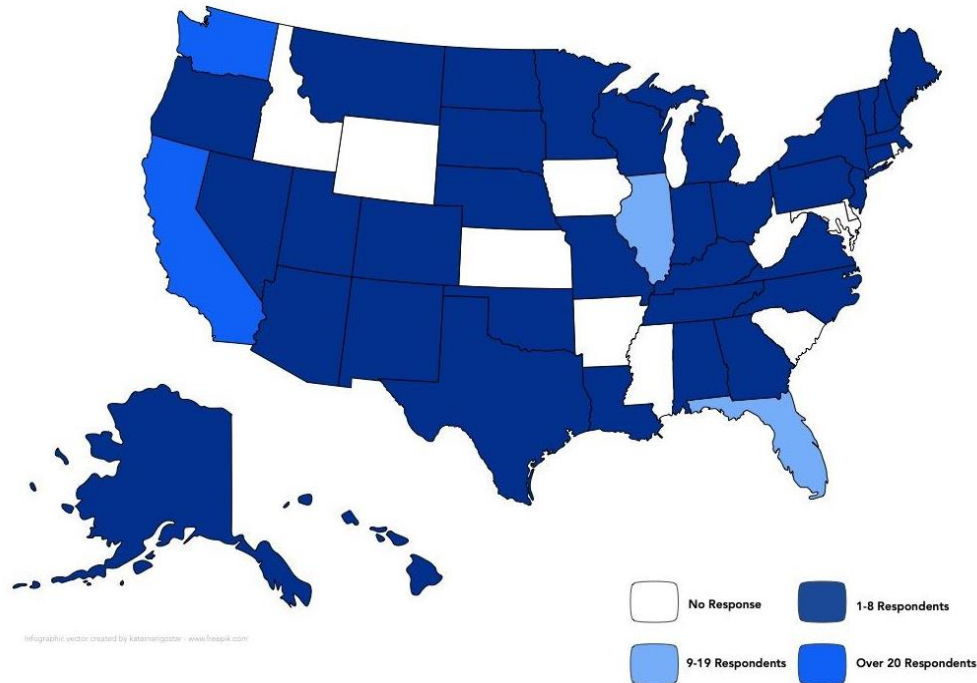


Figure 5. States in which survey respondents work (n=179).

Of the 179 respondents, 171 work and live in specific communities of different sizes from <10,000 (12%) to over 2 million (26%) residents (Figure 6). Eighty-eight percent of respondents indicate that their community is experiencing moderate to significant development or redevelopment pressure (Figure 7).

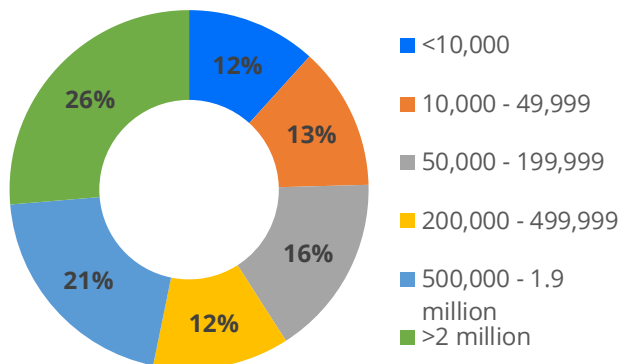


Figure 6. Population sizes of cities represented by respondents (n=171).

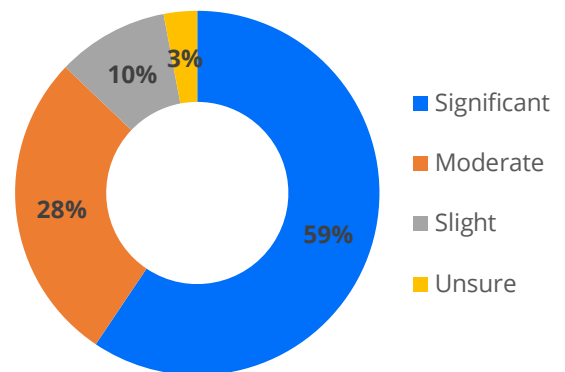


Figure 7. Degree of development or redevelopment pressure in cities (n=171).

Ninety-one percent of participants agree that climate change is having or is likely to have a significant effect on their communities (Figure 8). Overall, respondents indicate that they are very (27%), moderately (50%), or slightly (18%) knowledgeable about climate change, with only 5% indicating that they are not at all knowledgeable (Figure 9).

Respondents working in the environmental and economic justice field self-identified as having significantly higher knowledge about climate change than those representing the development, education and outreach, or housing sectors (Figure 10). The highest rankings of “not at all knowledgeable” came from respondents in housing (6%), development (4%), education and outreach (4%), public health (4%), and infrastructure (4%).



Figure 8. Percentage of respondents who believe climate change is affecting their community (n=171).

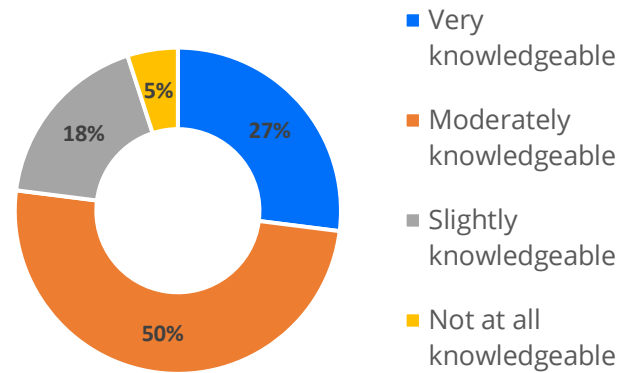


Figure 9. Respondents' level of knowledge about climate change (n=171).

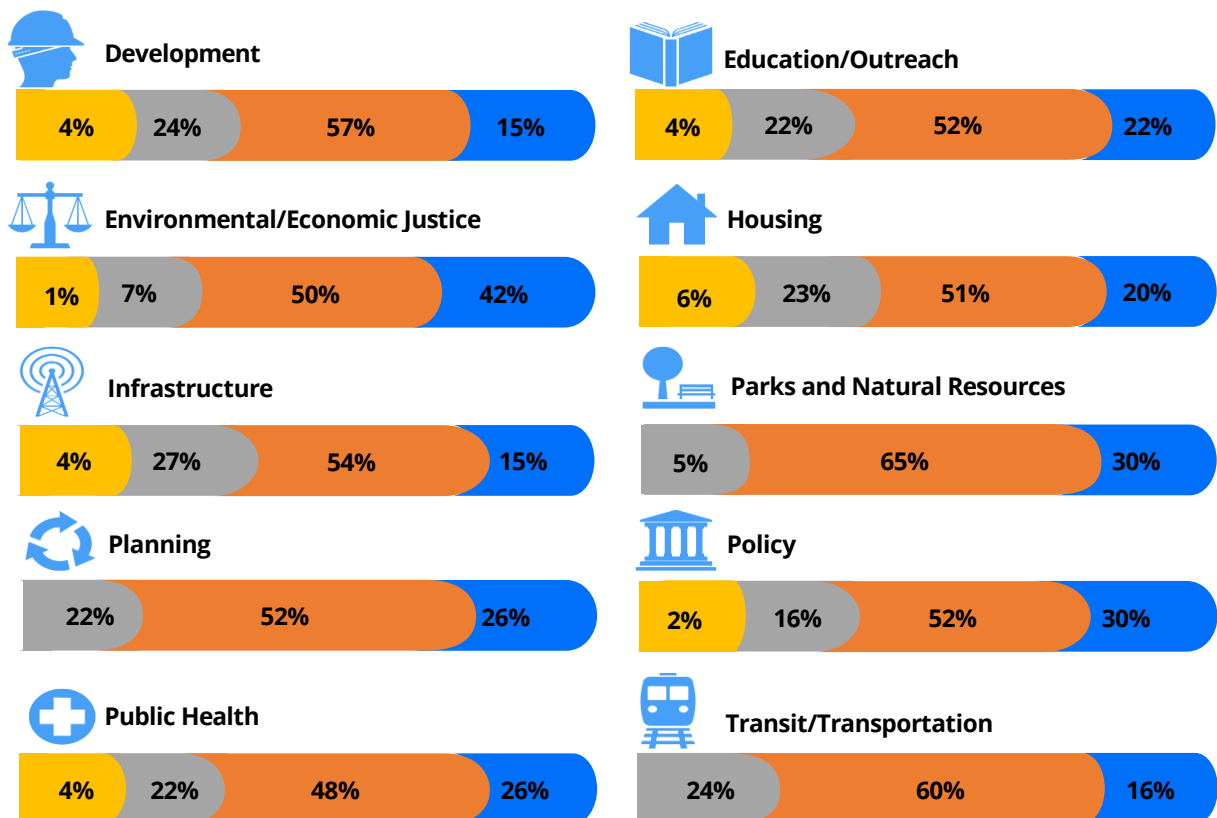


Figure 10. Respondents' level of knowledge about climate change by sector (those representing >15% of all respondents).

COMMUNITY PRESSURES

Participants were asked to identify community pressures and rank their level of concern about each (Figure 11). Issues such as the availability of affordable housing (74%), fair housing opportunities (72%), rising property values (65%), displacement of individuals and communities (63%), and cost of living (62%) ranked among those of the most frequently expressed concerns. Less than four percent of respondents indicate that these same issues are of no concern. Climate change factors frequently rank as the lowest issues of concern among respondents with increasing air temperatures (76%), storms and extreme weather events (74%), extreme heat events (73%), flooding (73%), drought (54%), sea level rise (49%), and wildfire (45%) noted as threats about which respondents are “very” or “moderately” concerned. Among these climate-related issues, at least 65% of respondents indicated some level of concern ranging from “very” to “a little” concerned.

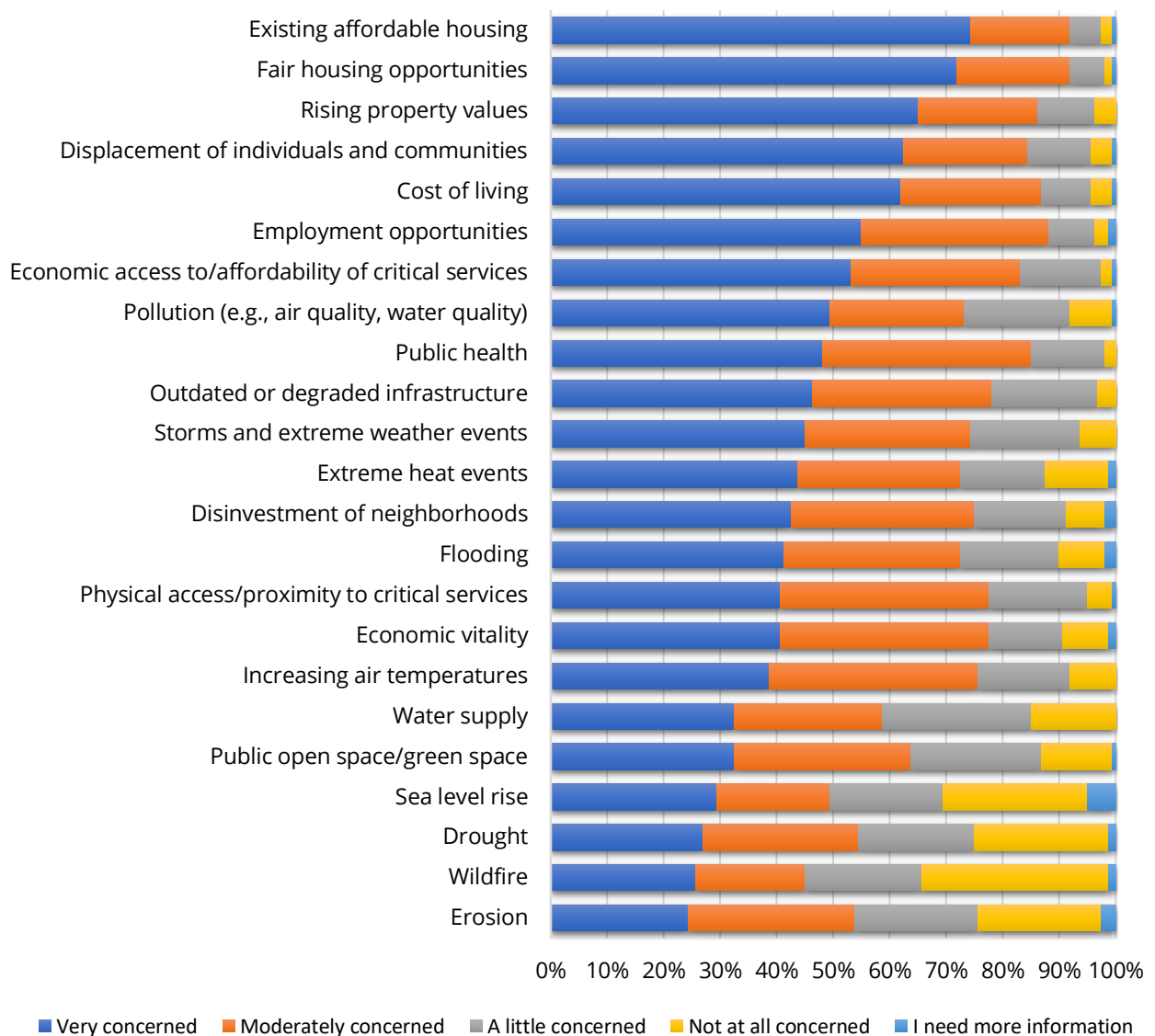












Figure 11. Pressures and level of concern of respondents (n=171).

Rankings of different community pressures also vary by sectors represented by respondents. Table 3 presents issues most frequently expressed as concerns by sector. For example, existing affordable housing was ranked as an issue about which 74% of all respondents are very concerned. Higher “very concerned” rankings were provided by representatives of the education/outreach (90%), policy (89%), transit/transportation (84%), environmental justice (84%), public health (82%), and planning (81%) sectors, while housing representatives only indicated a slightly higher level of concern (76%) compared with all respondents. With respect to displacement, higher “very concerned” rankings were provided by representatives of the environmental and/or economic justice (72%), policy (72%), transit/transportation (68%), parks and natural resources (67%), education/outreach (65%), and housing (65%) sectors compared with the ranking provided by all respondents (63%).

Table 3. Issues most frequently expressed as concerns compared by sector (those representing >15% of all respondents).

			Affordable housing	Fair housing opportunities	Rising property values	Displacement	Cost of living
		<i>Rankings by All Respondents</i>	74%	72%	65%	63%	62%
<i>Rankings by Sector (those representing >15% of all respondents)</i>		Development	74%	72%	61%	57%	50%
		Education/Outreach	90%	73%	65%	65%	67%
		Environmental and/or Economic Justice	84%	82%	74%	72%	74%
		Housing	76%	71%	64%	65%	64%
		Infrastructure	69%	73%	54%	54%	46%
		Parks and Natural Resources	76%	71%	62%	67%	71%
		Planning	81%	70%	59%	63%	59%
		Policy	89%	80%	69%	72%	67%
		Public Health	82%	70%	67%	59%	67%
		Transit/Transportation	84%	84%	60%	68%	76%



Of the climate issues ranked among those about which respondents are “very” concerned (Figure 11) are storms and extreme weather events (45%), extreme heat events (44%), flooding (41%), increasing air temperatures (39%), sea level rise (29%), drought (27%), and wildfire (26%). When filtering these overall rankings by respondents from SPARCC states, some clearer trends emerge (Figure 12).

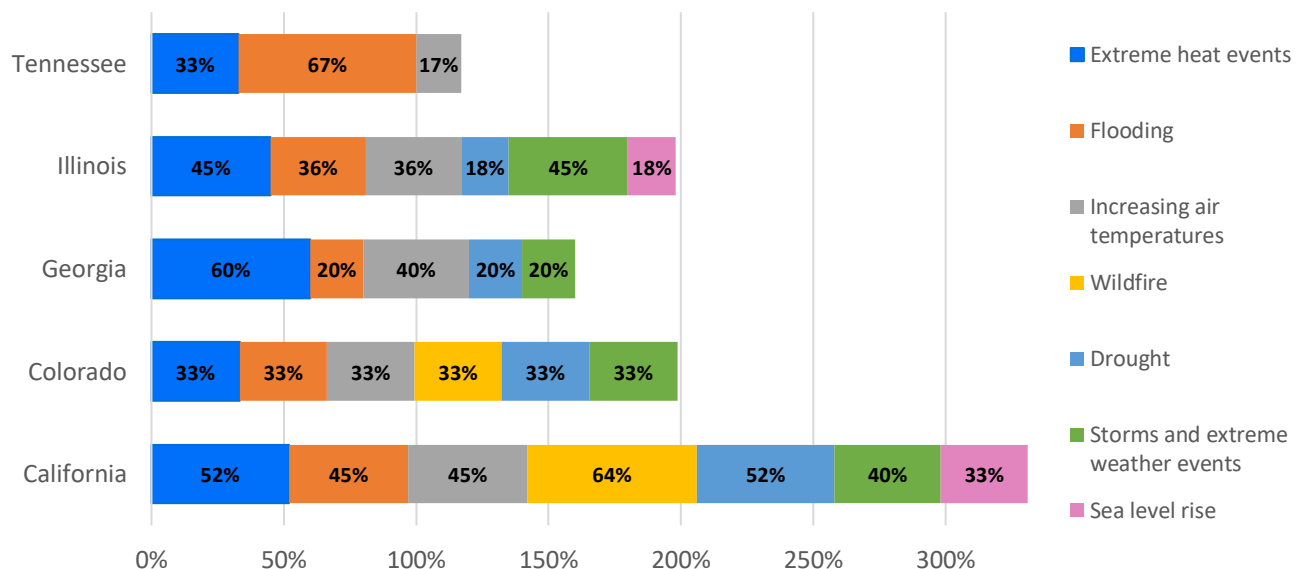












Figure 12. Climate factors most frequently noted as concerns by respondents from SPARCC states (n=67).

For example, wildfire only registers as a major issue of concern for western states such as Colorado (33%) and California (64%). Flooding ranks as the most frequently expressed concern for respondents from Tennessee (67%), while extreme heat events (60%) and storms (45%) are the most frequently expressed concerns by respondents in Georgia and Illinois, respectively.

Table 4 presents the climate change factors most frequently expressed as concerns by sector. For example, higher “very concerned” rankings were provided for storms and extreme weather events by representatives of environmental and/or economic justice (59%), parks and natural resources (52%), policy (48%), public health (48%), and education and outreach (47%) compared with all respondents (45%).

Table 4. Climate change factors most frequently expressed as concerns compared by sector (those representing >15% of all respondents).

			Storms and extreme events	Extreme heat events	Flooding	Increasing air temperatures	Sea level rise	Drought
		<i>Rankings by All Respondents</i>	45%	44%	41%	39%	29%	27%
<i>Rankings by Sector (those representing >15% of all respondents)</i>		Development	35%	32%	39%	28%	26%	22%
		Education/Outreach	47%	55%	45%	47%	35%	27%
		Environmental and/or Economic Justice	59%	60%	56%	53%	43%	35%
		Housing	37%	37%	35%	30%	24%	24%
		Infrastructure	42%	38%	50%	38%	19%	23%
		Parks and Natural Resources	52%	48%	38%	43%	29%	38%
		Planning	41%	41%	40%	33%	27%	21%
		Policy	48%	44%	43%	38%	31%	23%
		Public Health	48%	56%	48%	41%	26%	22%
		Transit/Transportation	32%	40%	36%	36%	28%	36%

Comparing across sectors in which more than 15% of respondents work, the following trends are noticeable:

- » Storms and extreme weather events are highly ranked by representatives of the environmental justice (59%), parks (52%), and health (48%) sectors;
- » Extreme heat events are highly ranked by representatives of the environmental justice (60%), health (56%), and education and outreach (55%) sectors;
- » Flooding is highly ranked by representatives of the environmental justice (56%), infrastructure (50%), and health (48%) sectors;
- » Increasing air temperatures are highly ranked by representatives of the environmental justice (53%), education and outreach (47%), and parks (43%) sectors;
- » Sea level rise is highly ranked by representatives of the environmental justice (43%), education and outreach (35%), and policy (31%) sectors;
- » Drought is highly ranked by representatives of the parks (38%), transit (36%), and environmental justice (35%) sectors; and
- » Wildfire is highly ranked by representatives of the transit (44%), parks (38%), and environmental justice (34%) sectors.



Image Credit: Athens, Julian Alexander, [Shutterstock](#)

KNOWLEDGE, PRODUCTS, AND SERVICES

Participants were also asked what information they currently use to make decisions. Most frequently mentioned types of resources used include best practices and lessons learned from other professionals, knowledge of community members and peers, and environmental, climate, and/or economic justice and equity information (Table 5).

Table 5. Resources currently used to make decisions by survey respondents (n=171).

Best practices and lessons learned	81%
Knowledge of stakeholders and community members	79%
Environmental, climate, and/or economic justice and equity information	74%
Knowledge from my peers	74%
Case studies	56%
Spatial data	52%
Grey literature (e.g., agency plans)	48%
Land cover and use data	42%
Scientific literature	41%
Models (e.g., atmospheric, ecosystem, economic)	37%

Additional resources needed to better address displacement pressures in a changing climate include case study examples from on-the-ground initiatives; example policies, ordinances, and model codes; trainings and webinars, and information on how to better communicate climate change to and engage the public (Table 6).

Table 6. Resources needed to more effectively take action on climate change as expressed by survey respondents (n=171).

Best practices/case studies	82%
Example policies, ordinances, and model codes	66%
Trainings, workshops, or webinars	54%
Information on how to communicate climate change to the public and engage stakeholders	52%
Guidance on how to integrate climate change into displacement work	52%
Peer-to-peer learning networks	39%

Participants were also asked to identify specific resources and tools they use to make decisions on climate change (Table 7).

Table 7. Resources and tools used by respondents.

Organization/Resource/Tool Name	Source/Website
Urban Sustainability Directors Network	The Urban Sustainability Directors Network is a group of local government professionals from the United States and Canada dedicated to sharing best practices and advancing sustainability; https://www.usdn.org
Headwaters Economics	Headwaters Economics is a nonprofit that supports community land-use planning and management through research on economic development, energy, equity, and public lands: https://headwaterseconomics.org
Climate-Smart Cities™ Program	The Trust for Public Land's Climate-Smart Cities™ Program helps communities develop and utilize parks and open space as green infrastructure. Partner cities include Boston, Los Angeles, Richmond, Cleveland, and New Orleans: https://www.tpl.org/how-we-work/climate-smart-cities
CalEnviroScreen 3.0	The California Environmental Protection Agency's Office of Environmental Health Hazard Assessment created the California Communities Environmental Health Screening Tool (CalEnviroScreen) to help users easily identify communities disproportionately affected by pollution: https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30
National Environmental Public Health Tracking Network	The Centers for Disease Control and Prevention runs the National Environmental Public Health Tracking Network to track health and environmental data from national, state, and local sources for public use: https://ephtracking.cdc.gov/
GreenTRIP Connect	TransForm created GreenTRIP Connect to help community members calculate carbon footprints and identify carbon reduction measures: http://www.transformca.org/greentrip/connect
<i>Our Communities, Our Power: Advancing Resistance and Resilience in Climate Change Adaptation Toolkit</i>	The NAACP Environmental and Climate Justice Program created this toolkit to help frontline communities create transformative change. Modules are shared on creating community working groups, developing community climate adaptation plans, enacting legislation, communicating climate resilience, building public awareness, creating local food initiatives, and creating resilient transportation systems, among others: https://live-naacp-site.pantheonsite.io/wp-content/uploads/2019/04/Our-Communities-Our-Power-TOOLKIT-FINAL.pdf

ADAPTATION MOTIVATIONS, BARRIERS, AND OPPORTUNITIES

About 64% of survey respondents report adjusting their activities in some way to address climate change. Of respondents indicating they are taking action, the primary motivating factors include concerns about climate justice and equity (80%), perceived threats from climate-related events (70%), general concern (64%), and observed changes in their community (56%) (Figure 13). Factors such as community demand (44%), perceived economic threats (42%), and access to new information on climate change (40%) also motivated action, while funding opportunities (21%) and mandates (11%) featured less significantly to respondents.

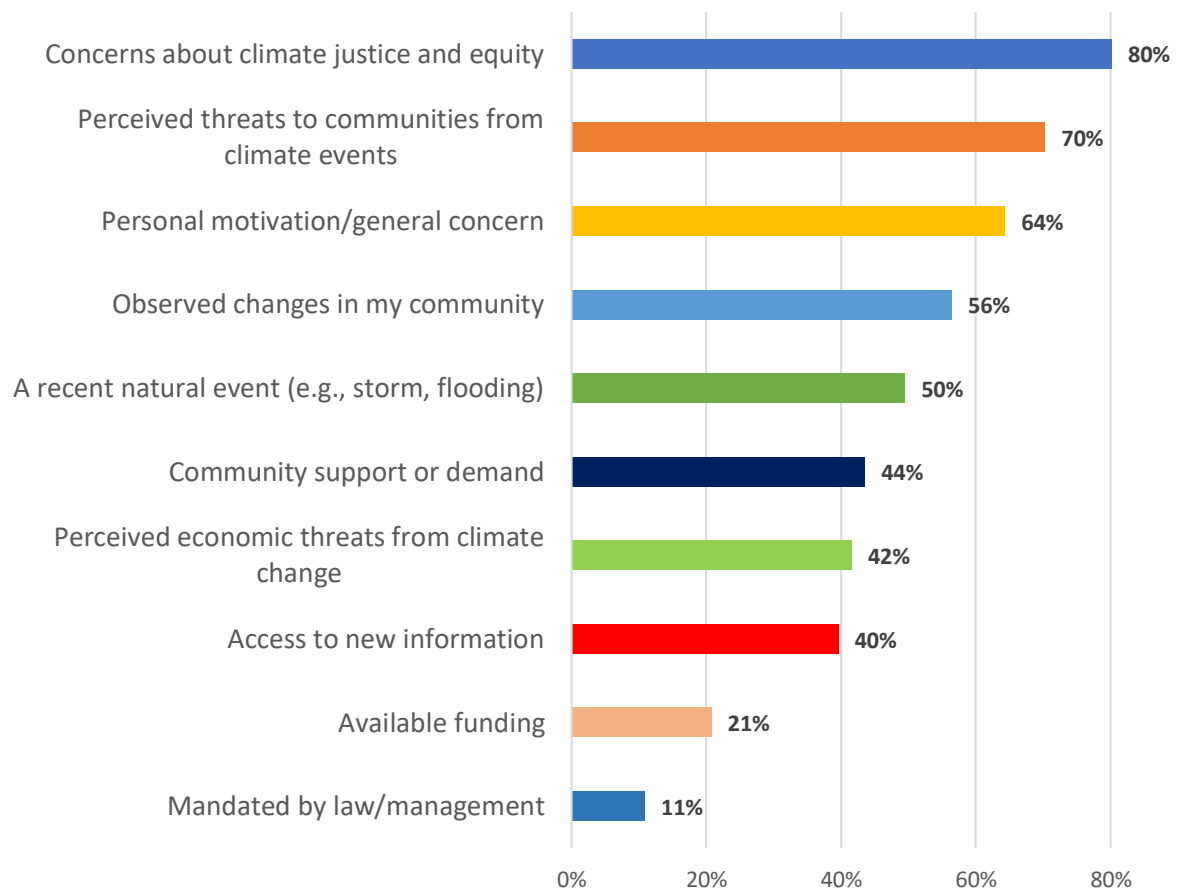


Figure 13. Factors motivating action by respondents addressing climate change in their work (n=101).

Participants were asked to identify specific barriers with respect to addressing displacement in a changing climate. The top two barriers noted by respondents who are engaged in climate adaptation and those who are not include lack of funding and insufficient staff resources and capacity (Figure 14). Funding is constrained by the amount of money available to communities, as well as by restrictions in types of funding. For example, most federal funding for natural disasters and extreme weather events is reactionary and focused on recovery; the slow onset of climate-driven impacts is

not factored into funding programs to provide for proactive pre-hazard mitigation efforts. Current more pressing issues such as general economics are shared perceived barriers for both sets of respondents, although they rank higher for those not engaged in climate adaptation (53%). Among the lowest perceived barriers for both sets of respondents are lack of clarity about which adaptation options are available and lack of specific climate data for communities.

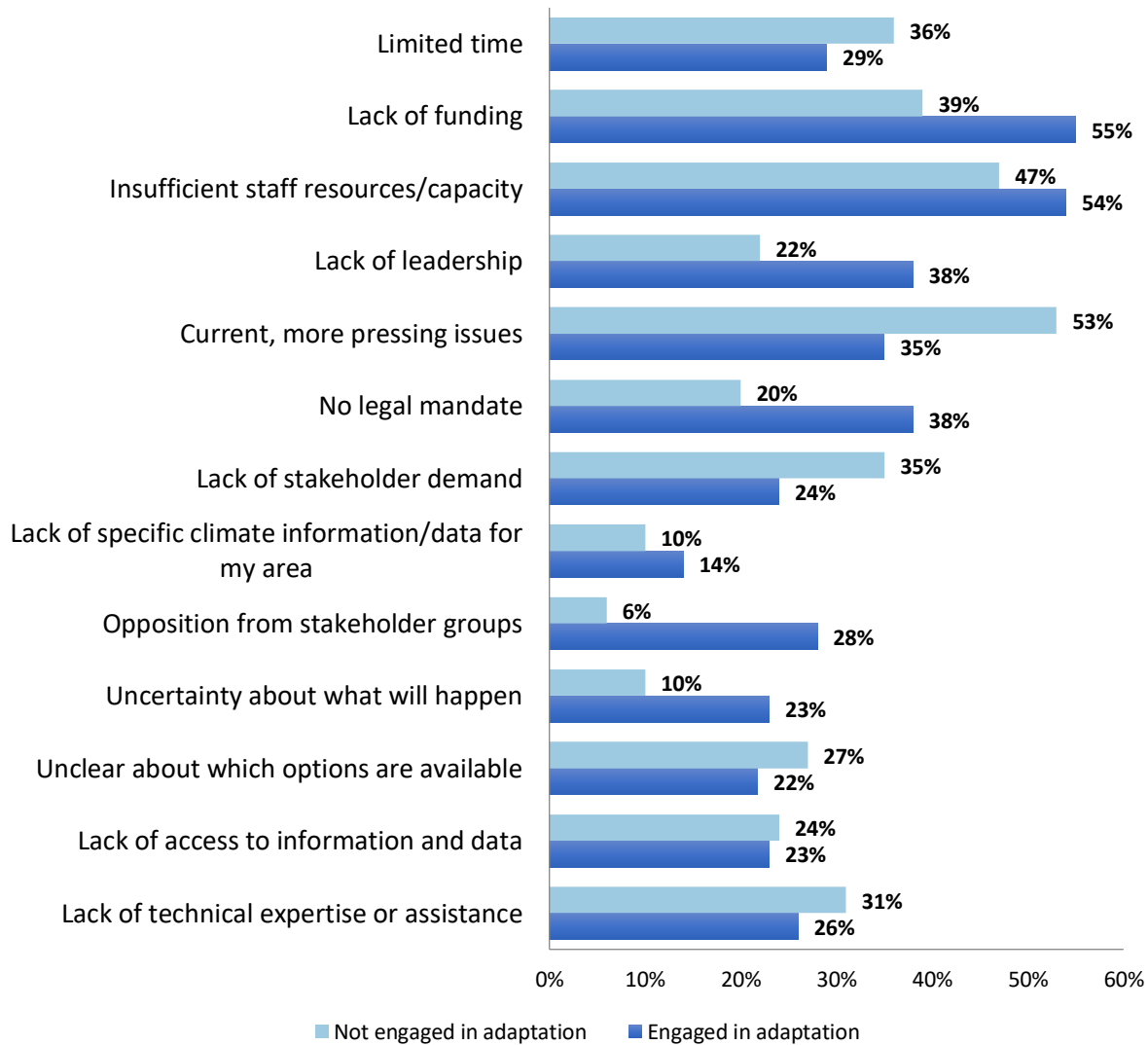


Figure 14. Barriers noted by respondents currently engaged in climate adaptation (n= 101; dark blue) and those who are not (n=57; light blue).

Figure 15 presents perceived barriers among those engaged in climate action. Insufficient resources and capacity is a key challenge for 72% of respondents from the parks and natural resources and infrastructure sectors, respectively, and 71% of those from public health. Respondents representing

housing indicate that current more pressing issues (39%), lack of leadership (39%), and uncertainty (31%) also present challenges. Lack of specific climate data for communities was not highlighted as an issue of broad concern for most respondents, except those representing infrastructure (33%), parks and natural resources (28%), and transit (26%).

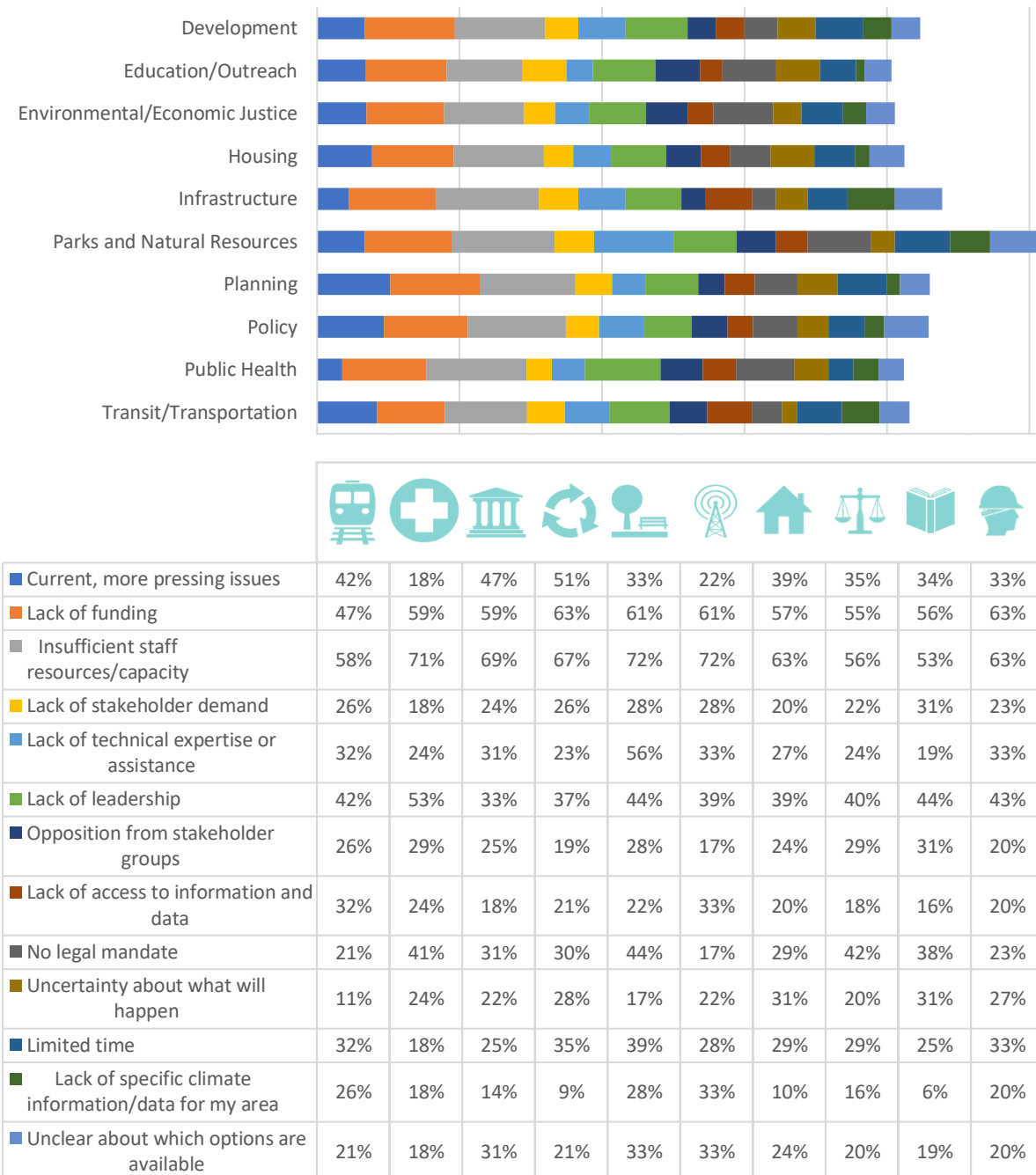
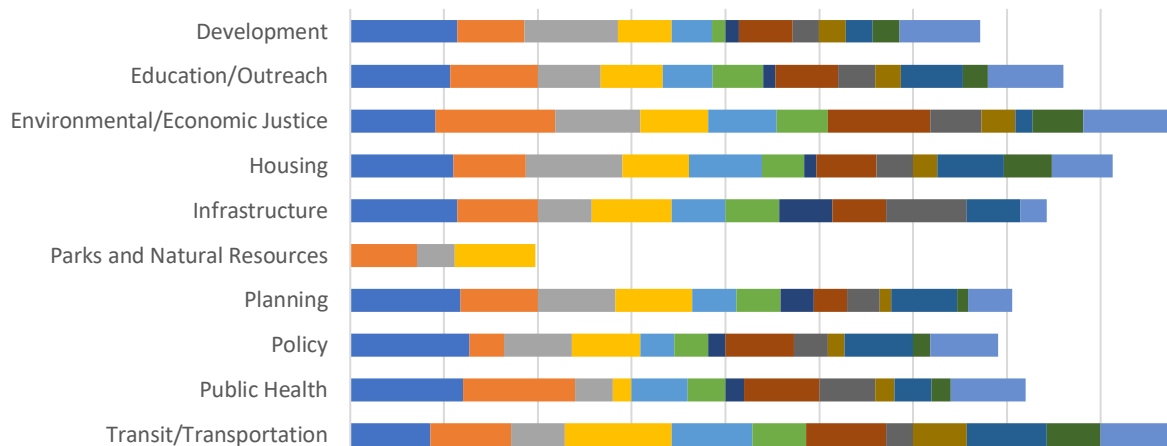


Figure 15. Key barriers noted by respondents representing specific sectors who are currently engaged in climate adaptation (n=101).

Figure 16 presents perceived barriers among those not engaged in climate action. Current more pressing issues is a key challenge for 64% of respondents representing the policy sector, followed by 60% from public health and 59% from planning. Sixty-four percent of respondents from the environmental justice field agree that lack of funding is a challenge, followed by lack of access to information and data (55%), and lack of clarity about which options are available to support decision making (45%). Lack of specific climate data for communities was not highlighted as an issue of broad concern for most respondents, except those representing transit (29%), environmental justice (27%), and housing (26%).













										
■ Current, more pressing issues	43%	60%	64%	59%	0%	57%	55%	45%	53%	57%
■ Lack of funding	43%	60%	18%	41%	36%	43%	39%	64%	47%	36%
■ Insufficient staff resources/capacity	29%	20%	36%	41%	20%	29%	52%	45%	33%	50%
■ Lack of stakeholder demand	57%	10%	36%	41%	43%	43%	35%	36%	33%	29%
■ Lack of technical expertise or assistance	43%	30%	18%	24%	0%	29%	39%	36%	27%	21%
■ Lack of leadership	29%	20%	18%	24%	0%	29%	23%	27%	27%	7%
■ Opposition from stakeholder groups	0%	10%	9%	18%	0%	29%	6%	0%	7%	7%
■ Lack of access to information and data	43%	40%	36%	18%	0%	29%	32%	55%	33%	29%
■ No legal mandate	14%	30%	18%	18%	0%	43%	19%	27%	20%	14%
■ Uncertainty about what will happen	29%	10%	9%	6%	0%	0%	13%	18%	13%	14%
■ Limited time	43%	20%	36%	35%	0%	29%	35%	9%	33%	14%
■ Lack of specific climate information/data for my area	29%	10%	9%	6%	0%	0%	26%	27%	13%	14%
■ Unclear about which options are available	43%	40%	36%	24%	0%	14%	32%	45%	40%	43%

Figure 16. Key barriers noted by respondents representing specific sectors who are not engaged in climate adaptation (n=57).

Sixty-four percent of survey respondents report adjusting their activities in some way to address climate change. Participants were asked to categorize their work to date from a series of strategies related to Infrastructure and Development, Transportation and Other Critical Services, Capacity Building, and Policy. Figures 17–20 present the answers provided by those engaged in climate action regarding strategies in use and those not used but of interest.

Among the strategies **most in use** by respondents are:

- » Increasing engagement with community groups in planning processes to develop and implement climate-informed actions (66%);
- » Diversifying the supply of affordable housing options (via funding opportunities, inclusionary zoning, tax incentives, accessory dwelling units) (52%);
- » Co-locating reliable transportation with affordable housing (51%);
- » Investing in workforce development (e.g., job training, green jobs) (47%);
- » Investing in green building to reduce utility costs (46%);
- » Integrating equity and just economy principles into climate action and resilience plans (44%);
- » Incorporating climate change and racial equity impact assessments into policy and investment decision-making (43%);
- » Incorporating anti-displacement criteria into investment and development rubrics (42%);
- » Incentivizing public transit use (41%);
- » Providing technical assistance to vulnerable individuals and communities (e.g., legal aid for property owners and renters, support on complex application processes) (41%); and
- » Maintaining tree canopy to reduce utility costs in low-income neighborhoods (40%).

Among the strategies **not currently used but of high interest for future** use by respondents are:

- » Using passive heating and cooling in affordable housing stock design and retrofits (73%);
- » Intentionally accommodating displacement by identifying and protecting future relocation sites (71%);
- » Implementing transitional housing programs for vulnerable individuals (e.g., those displaced by natural disasters and climate change) (71%);
- » Revising federal, state, and local policies to permit relocation of individuals, communities, and infrastructure (66%);
- » Revising policies to include gradual biophysical processes such as erosion to allow for pre-disaster hazard mitigation declarations (65%);
- » Revising insurance programs to support climate-informed retrofits and relocation (65%);
- » Incorporating climate change and resilience measures into investment and development rubrics (63%);
- » Limiting development in locations vulnerable to the effects of climate change (63%);
- » Providing funding assistance to individuals and communities (e.g., homeowner assistance programs, housing rehabilitation funds) in locations vulnerable to the effects of climate change (61%); and
- » Maintaining access to critical services (e.g., medical, transportation, utilities) during and in the aftermath of extreme events (61%).

Infrastructure and Development

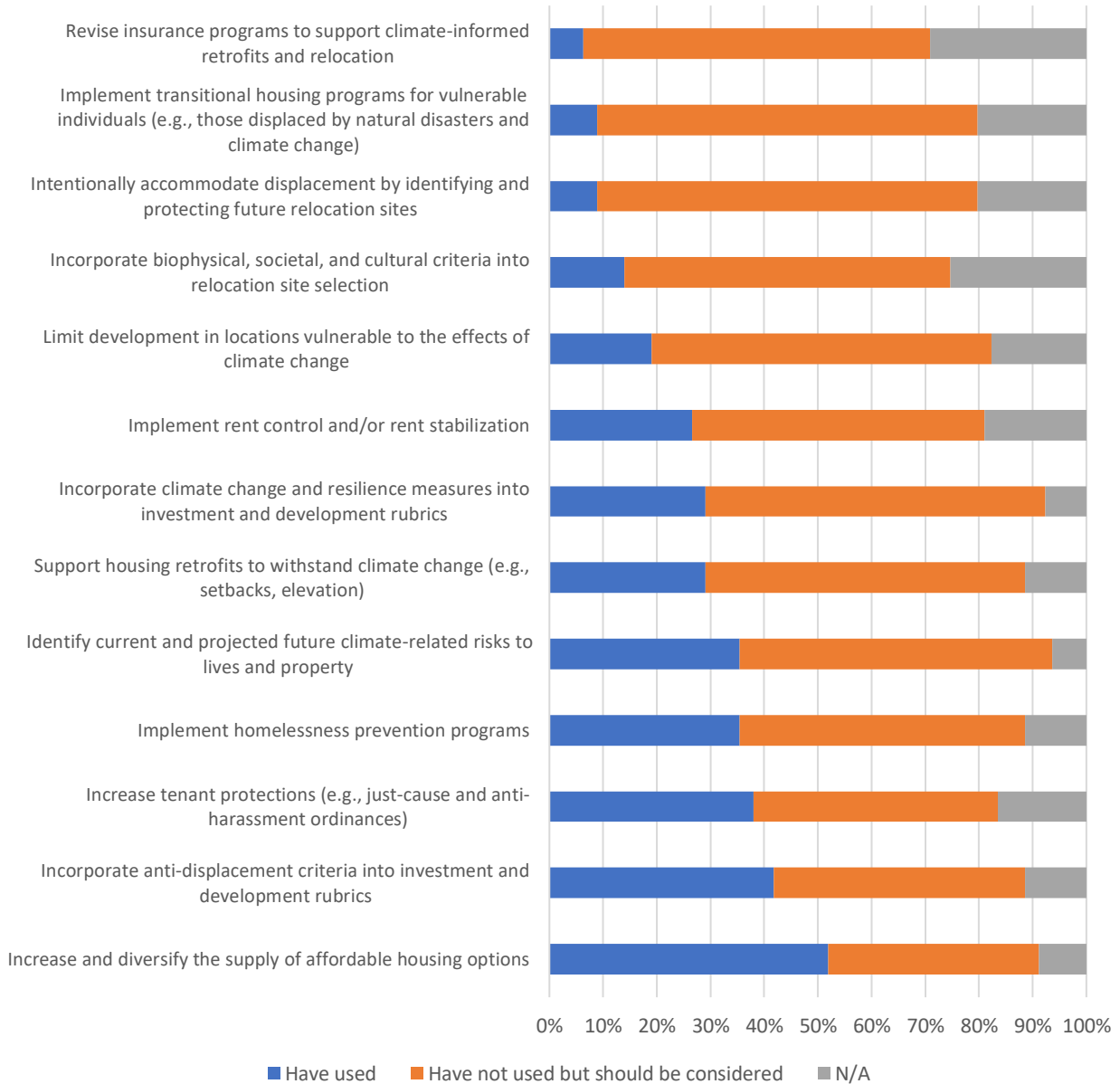


Figure 17. Infrastructure and development strategies in use by respondents engaged in climate action (n=101).

Transportation and Other Critical Services

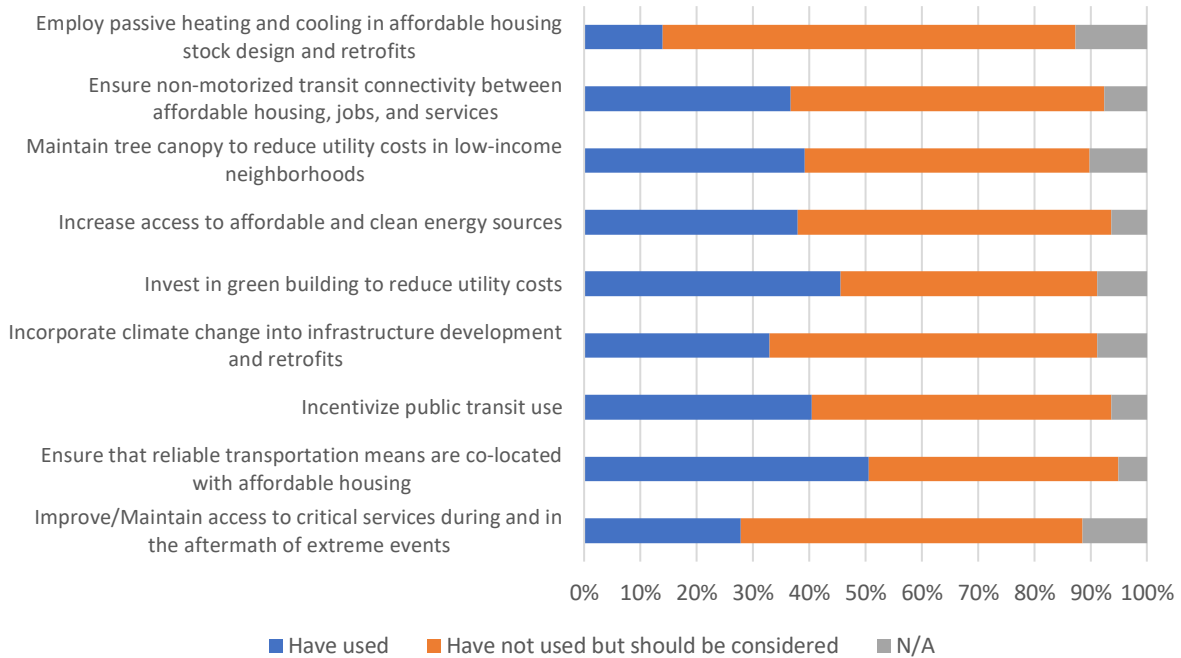


Figure 18. Transportation and other services' strategies in use by respondents engaged in climate action (n=101).

Capacity Building

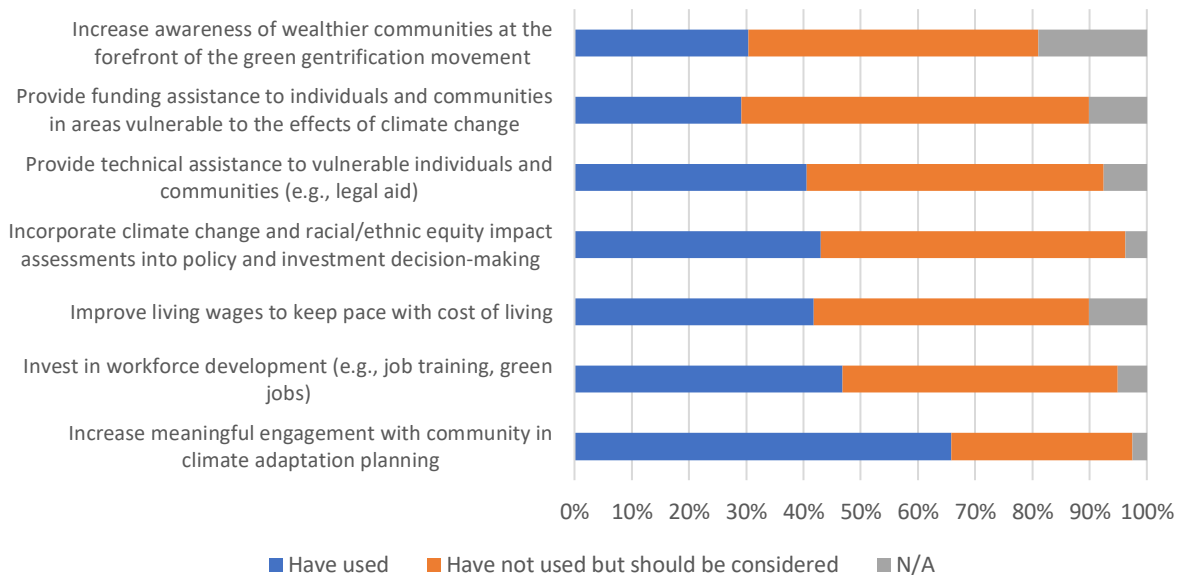


Figure 19. Capacity building strategies in use by respondents engaged in climate action (n=101).

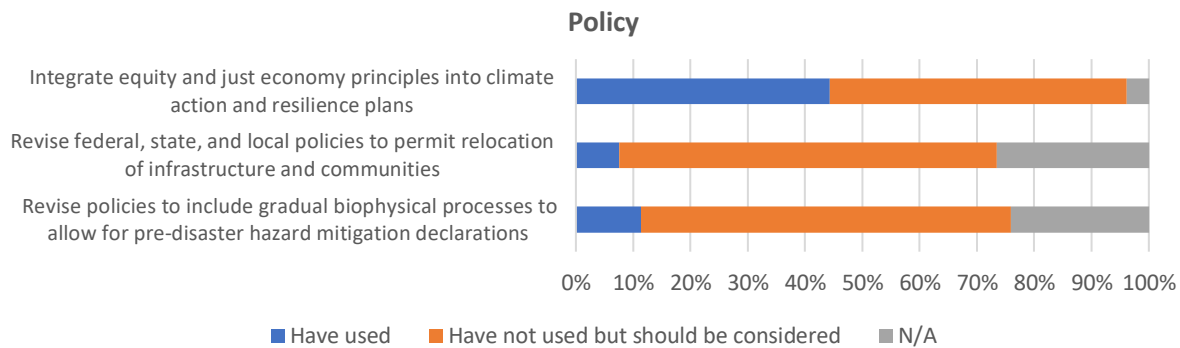


Figure 20. Policy strategies in use by respondents engaged in climate action (n=101).

Anti-Displacement Activities That May Increase Community Vulnerability to Climate Change

All participants were asked to consider strategies or activities that are vulnerable or may cause increased community vulnerability to climate change.

Many of the anti-displacement activities expressed by respondents that may be vulnerable to the effects of climate change or may increase community vulnerability are related to maintaining the status quo as baseline problems contribute to community instability. For example, low-income housing is frequently sited near sources of industrial pollution or within areas frequently subjected to disturbances such as flooding, and sub-standard housing—whether poorly constructed or maintained—is more vulnerable to the effects of extreme weather events.

"Persons who live in poverty or in areas of high minority concentrations may be the victims of extreme weather events followed by community reconstruction activities that effectively force out the original poor, minority populations due to the high costs of rent and living. Certain areas may be designated high-risk zones which may result in displacement of poor, minority populations who have no other 'affordable' options."

"We need to figure out how to stabilize these neighborhoods, and improve their resilience, without spurring displacement."

"[Within coastal areas,] the challenge will primarily be on renters. Homeowners will either stay in place or [be] compensated for their property."

Limitations in resources, economic and job opportunities, and access to critical services also amplify individual and community vulnerability to climate change. Specific areas of vulnerability noted by participants include resource-poor neighborhoods, and highly specialized or seasonal natural resource-dependent jobs. For example, there may be spatial mismatches between where poor neighborhoods are located and where suitable job opportunities are available; access to food, reliable transit, and medical care may also be lacking. Communities with natural resource-based economies (e.g., recreation, tourism, fishing, farming) or individuals who rely on seasonal outdoor work are also subject to fluctuations in environmental conditions (e.g., snow for skiing, water for boating).

"Food availability programs are vulnerable to rising food costs as climate change impacts production of food, driving up costs."

"Limited resources (and concentrated wealth where resources are abundant) are the biggest challenge because a lot of improvements cost significant dollars in addition to industry shifts. Anything that has to do with investment is the most vulnerable to climate change because it comes with so much baggage and politics that are difficult to deal with in a timely manner."

"Our economy is extremely tourism-based and dependent upon good summer conditions (aka no snow) and winter conditions (enough snow for skiing). Most workers are seasonal workers who depend on [the] tourism industry or industry-adjacent jobs. If the tourist season changes then the housing demand [and] job demand will change as well, potentially displacing 1000s of workers."

Maladaptive policies or practices also make communities more vulnerable to climate change. These policies or practices may increase risk to the impacts of climate change, increase greenhouse gas emissions that cause climate change, or otherwise negatively affect people's wellbeing. Examples include rebuilding in high-risk flood zones, permitting development without accounting for climate risk, and increasing the use of energy-intensive air conditioners to combat extreme heat events.

"Trying to help people remain in a neighborhood that is prone to flooding or other hazards is probably the most vulnerable activity. At some point, the costs of remaining may become untenable."

"There may be some complex interplays between climate mitigation and climate adaptation. For example, relying on AC units to reduce public health impacts of extreme heat and helping elders stay in their homes will also increase the emissions for long term climate impacts."

"Building densely-packed areas: Urban development plans must take into account urban heat islands and any new development or expansion should incorporate mitigation strategies to avoid expanding the urban heat island effect."

"Insurance policies that allow rebuilding in impacted areas or that allow rebuilding without taking climate issues into consideration leads to erosion of capital for re-occurring issues."

Anti-Displacement Activities That May Increase Community Resilience to Climate Change

All participants were asked to consider strategies or activities that may increase community resilience to climate change.

INFRASTRUCTURE AND DEVELOPMENT

Participants noted several opportunities to increase community resilience to climate change. Resilient practices related to **infrastructure and development** include integrating climate change into the design and building of new housing and housing developments and retrofitting existing buildings, investing in community revitalization and stabilization, and incorporating climate change and equity concerns in community land-use planning. Climate- and equity-informed development includes incentivizing practices such as conducting vulnerability assessments of potential development locations, building in areas less likely to be impacted by climate change, creating mixed housing developments (e.g., mixed incomes, mixed businesses, mixed building types), promoting community land ownership (e.g., community land trusts, nonprofit-owned rentals, resident-owned cooperatives), and co-locating affordable housing with green space.

"In all new construction, evaluate the site for potential negative impacts from climate change, and provide incentives to live and build in less at-risk areas."

"Encourage or require developers to include mixed housing in every new development so that there is no single area that can be effectively targeted for displacement."

"Creating land trusts within communities to preserve green spaces and allow them to buffer for climate change impacts."

"Break the narrative that displacement and gentrification of urban centers is a sad but necessary part of making our cities more compact and climate ready. Build anti-displacement strategies into all planning and infrastructure funding for climate resilience. Like you can't build your seawall with X money unless you utilize one or more of Y strategies to help support community stability. And you can't do your community resilience plan with Z money unless you explicitly consider displacement threats, and how you will counter them."

Examples: Infrastructure and Development

- » The **City of Hoboken, New Jersey**, is creating joint green space-housing developments in the aftermath of Hurricane Irene and Superstorm Sandy. The 7th and Jackson Stormwater

Project/Resiliency Park recently broke ground on the construction of a \$20-million mixed-use residential building with ~10% affordable housing units along with a two-acre park that is capable of retaining over 450,000 gallons of stormwater to reduce flooding.⁵

- » **Norfolk, Virginia**, recently enacted new zoning regulations to require all new development to meet a “resilience quotient” wherein all proposed infrastructure is evaluated on climate resilience criteria—for example, reducing flood risks, supporting mobility options, and energy efficiency.⁶ All new buildings and existing structures that have experienced two major flood events are now required to comply with a 3-foot freeboard standard; the former standard was 1-foot.
- » Earth Economics, in partnership with the Community Justice Project, conducted a cost-benefit analysis of the proposed Magic City Innovation District development in **Little Haiti, Miami**.⁷ The study found that the proposed development is likely to exacerbate existing economic and racial inequities in the neighborhood with the majority of residents comprising low-income families of color, and reduce the area’s overall resilience to climate change. For example, the study links land-use changes such as conversion of green space to pavements, increased building heights, and increased road congestion to degraded ecosystem services (e.g., decreased air and water quality), increased urban heat island effects, and increased air pollution, while rising property values and rents will lead to displacement of long-term residents.
- » The **Los Angeles** Regional Open Space and Affordable Housing (LA ROSAH) initiative aims to advance parks and affordable housing joint developments to show that community health and resilience can be improved through urban greening without causing displacement. As part of LA ROSAH’s ongoing work, they invite housing developers to pitch projects that integrate parks or open space on planned affordable housing developments. See the full case study on the work of Enterprise Community Partners on page 36.

TRANSPORTATION

Resilient practices related to **transportation and other critical services** include integrating climate projections into designing new and retrofitting existing infrastructure, such as roads, highways, hospitals, and utilities, and improving and maintaining access to services during extreme events. Climate change and extreme weather events may result in infrastructure damage or destruction, restricted access to medical facilities, reduced capacity to provide medical services, and/or

“Encourage developers to give free transit passes and charge for parking. Encourage cities to eliminate parking minimums in development standards in order to encourage more housing and discourage driving.”

“[Create] amendments for urban agriculture ordinances and support to grow nutritious food locally, increase access to mental health networks for resiliency awareness and support, and [provide] energy efficiency support for property owners/renters.”

⁵ City of Hoboken. 2019. 7th & Jackson Resiliency Park. Available at <https://www.hobokennj.gov/resources/7th-jackson-resiliency-park>

⁶ City of Norfolk, Virginia. 2019. Building a Better Norfolk: A zoning ordinance for the 21st century. Available at <https://www.norfolk.gov/DocumentCenter/View/35581/Adopted-Zoning-Ordinance?bidId=>

⁷ Earth Economics. 2019. Potential Environmental and Social Costs of the Magic City Innovation District. Technical Summary. Available at <https://www.earthconomics.org/littlehaiti>

disruption in food and energy supplies for communities. In addition, vulnerable individuals may be affected by a lack of access to reliable daily transit options. Improving and expanding resilient options for vulnerable individuals and communities in service-limited areas in a changing climate is critical. Examples include incentivizing public transit use, climate-proofing facilities, and expanding access to local food sources in low-income and food-insecure neighborhoods.

"[Promote] use of public transportation. Residents relying on cars are less resilient if they are displaced."

"Updating and upgrading the electrical grid should be a nationwide priority, since the grid is affected by all types of extreme weather events from heat waves and extreme cold to storms."

Examples: Transportation and Other Critical Services

- » **Brooklyn's** Seagate Rehabilitation and Nursing Center (formerly known as the Shorefront Rehabilitation Center) is elevated almost 30 feet above ground to accommodate flooding. In addition, the facility's emergency power supply is capable of maintaining power to all systems and equipment during power outages. During Superstorm Sandy, the center was able to withstand the floodwaters, the emergency power supply supported services for four days during the local power outage, and staff and patients were able to safely shelter in place during the storm due to the center's sufficient supply of food and medical supplies.⁸
- » The neighborhood of South Madison is considered a food desert and healthy food access priority area in **Madison, Wisconsin**. The Center for Resilient Cities hosts the Badger Rock Neighborhood Center, which actively promotes urban agriculture and community gardens as a way to boost local food supply.⁹ Climate change is causing a northward shift of plant species and will likely increase drought stress and soil erosion. In response, the Center for Resilient Cities has initiated an effort to expand on-site infrastructure to accommodate more space for community and household gardens, host a local farm stand and monthly community meals, and plant and cultivate species likely to be found in the region even as the climate changes (e.g., dwarf fruit trees such as cherry, persimmon, and kiwi).
- » The **City of Chicago** was selected as one of the Rockefeller Foundation's 100 Resilient Cities and created a strategy to guide urban growth in light of climate change and socioeconomic problems such as income and housing inequities.¹⁰ The Resilient Chicago plan focuses on three pillars—

⁸ Taken from Gregg RM, Braddock KN, Kershner JM. 2019. The State of Climate Adaptation in Public Health: An Assessment of 16 U.S. States. EcoAdapt, Bainbridge Island, WA. Available at <https://www.cakex.org/documents/state-climate-adaptation-public-health-assessment-16-us-states>

⁹ Caton Campbell M, Johnson M. 2019. The Center for Resilient Cities' Climate-Informed Food Access and Community Resilience Project. Ed. Rachel M. Gregg. [Case study on a project of Madison, Wisconsin's Center for Resilient Cities]. Retrieved from CAKE: <https://www.cakex.org/case-studies/center-resilient-cities'-climate-informed-food-access-and-community-resilience-project> (Last updated April 2019)

¹⁰ City of Chicago. 2019. Resilient Chicago: A Plan for Inclusive Growth and a Connected City. Available at <https://resilient.chicago.gov/download/Resilient%20Chicago.pdf>

Strong Neighborhoods, Robust Infrastructure, and Prepared Communities—in which the city will aim to increase its resilience. For example, the strategy calls for the development of a citywide urban agriculture plan to increase the supply of local nutritious food, create employment opportunities, and implement the Growing for Chicago Initiative to provide technical and financial assistance for local urban farmers. In addition, the Chicago Housing Authority, Department of Planning and Development, and Chicago Public Library are partnering to develop mixed-income developments co-located with public libraries in order to provide affordable housing, accessible library resources, and safe neighborhood centers that promote community connection and cohesion.

- » The Partnership for Southern Equity focuses on connecting communities and increasing quality of life through their Equitable Transit-Oriented Development program.¹¹ For example, they are working with the **Atlanta** Regional Commission to engage community members in transit planning and understanding the transit needs of Atlanta's residents so that the city can become less car-dependent while avoiding displacement. See the full case study on the work of the Partnership for Southern Equity on page 43.

POLICY

In order to enable widespread community resilience, **policy** changes are needed. For example, survey respondents note that stronger tenant protections such as just-cause eviction ordinances and rent control are needed to prevent systemic displacement and promote tenant and housing stability. Tax incentives were also mentioned as potentially useful to promoting climate-informed development and green infrastructure. Integrated decision-making processes and policy frameworks were also frequently mentioned. Requiring cross-sectoral planning and implementation between housing, transportation, parks, and utilities to consider inclusionary zoning, displacement pressures, and climate change may lead to more effective, equitable, and resilient developments. In addition, flexibility in land-use planning and policies are needed to accommodate the relocation of individuals and communities.

"Allow more density in zoning codes to allow for more housing development."

"Integrated policy frameworks that require utility, municipal, and water/wastewater authorities to consider impacts of projects simultaneously and plan/collaborate/cost-share accordingly."

"Allow for local preference for displaced residents in climate-resilient areas."

"There is a need for a county-wide mandate for anti-displacement that brings together different county agencies—housing, transportation, parks—to look at development with an anti-displacement lens and language to keep residents in place as healthy developments grow."

¹¹ Partnership for Southern Equity, Equitable Transit-Oriented Development: <https://sites.google.com/view/justgrowth/etod>

Examples: Policy

- » Increasing storms are likely to overwhelm aging stormwater infrastructure in **Ann Arbor, Michigan**, resulting in more frequent combined sewer overflows. The city credits residents' stormwater utility bills if green infrastructure (e.g., rain barrels, rain gardens) is installed to reduce the amount of stormwater entering the sewer system. This unique financing mechanism reduces local stormwater pollution and funds local capital improvements.¹²
- » Climate change is causing forced relocation of native coastal communities in Alaska (e.g., **Native Alaska Villages of Kivalina**,¹³ **Shishmaref**,¹⁴ and **Newtok**¹⁵) and Washington State (e.g., **Hoh Tribe, Quileute Tribe**). Increased flooding from storm surges and rising sea levels are pushing communities out of their traditional lands, degrading or destroying infrastructure, and disrupting cultural practices and ways of life. Several communities have identified potential relocation sites further inland or upland but have been halted by massive costs, local political disputes, and conflicting desires of community members. For example, the federal government does not recognize climate change as a qualifier for disaster relief funds. Congress approved a land transfer of 37 acres from the adjacent Olympic National Park to the Hoh Tribe; this property, along with another several hundred acres purchased by the tribe, creates a contiguous piece of usable land for the relocation of tribal housing and infrastructure to higher ground and out of a high-risk flood zone.
- » **Palm Beach County, Florida**, has experienced several major hurricanes over the last few decades and is vulnerable to flooding and erosion from storm surges and sea level rise. The county's Post-Disaster Redevelopment Plan notes the importance of creating and maintaining emergency shelters, temporary housing (including workforce housing for firefighters, police, service workers, etc.), and long-term affordable housing, especially for low-income residents, all while limiting redevelopment in vulnerable sites. The plan states: "[The county] developed a vision for its land use planning efforts years ago that has revolved around maintaining a diverse community that includes urban and rural communities and all levels of income households. To maintain that vision after a disaster will mean that affordable housing continues as a community

¹² Kershner JM. 2012. Climate Adaptation in the City of Ann Arbor, Michigan [Case study on a project of the City of Ann Arbor]. Product of EcoAdapt's State of Adaptation Program. Retrieved from CAKE: www.cakex.org/case-studies/climate-adaptation-city-ann-arbor-michigan (Last updated October 2012)

¹³ Gregg RM. 2010. Relocating the Village of Kivalina, Alaska Due to Coastal Erosion [Case study on a project of the Kivalina Relocation Planning Committee]. Product of EcoAdapt's State of Adaptation Program. Retrieved from CAKE: <http://www.cakex.org/case-studies/relocating-village-kivalina-alaska-due> (Last updated December 2010)

¹⁴ Gregg RM. 2010. Relocating the Native Village of Shishmaref, Alaska Due to Coastal Erosion [Case study on a project of the Shishmaref Erosion and Relocation Coalition]. Product of EcoAdapt's State of Adaptation Program. Retrieved from CAKE: <https://www.cakex.org/case-studies/relocating-village-kivalina-alaska-due-coastal-erosion> (Last updated December 2010)

¹⁵ Feifel K, Gregg RM. 2010. Relocating the Village of Newtok, Alaska due to Coastal Erosion [Case study on a project of the Newtok Planning Group]. Product of EcoAdapt's State of Adaptation Program. Retrieved from CAKE: www.cakex.org/case-studies/relocating-village-newtok-alaska-due-coastal-erosion (Last updated October 2013)

priority both pre- and post-disaster.” Tactics to achieve this objective include identifying areas with the most vulnerable housing stock and making sure that temporary housing sites are located nearby, providing assistance in locating rental units for temporary housing (e.g., connecting displaced persons with information provided by landlords and rental agencies on undamaged available units), allowing local businesses to create temporary on-site employee housing through special permitting, and creating community land trusts to preserve existing and reestablish lost affordable housing.¹⁶

- » Anti-displacement avoidance policies have been integrated into the grant administration of **Los Angeles’** Measure A, a parcel-tax for the development of parks. The Measure A Grant Administration Manual provides guidelines to avoid displacement and scoring criteria that evaluates applications based on multiple criteria, including potential displacement.¹⁷ See the full case study on the work of Enterprise Community Partners on page 36.

CAPACITY BUILDING

Capacity building measures, including increased public education and engagement, investment in the workforce, and technical and financial assistance are needed to improve climate resilience in vulnerable communities. Public awareness campaigns may increase buy-in and political and social capital to support climate-informed decision-making, while investing in building the capacity of community leaders can create local champions to implement resilient measures. More meaningful community engagement in planning will likely elevate issues of equity and climate justice in decision-making, and may create more social cohesion for community members to remain connected during extreme events.

“Assistance to businesses, municipalities, and homeowners in accessing incentives and technical support for installing solar; support for developing community solar projects; summits and workshops to inform municipal and business leaders on opportunities and technical access for clean energy implementation.”

“Giving information and educating the populace will make people more determined to counteract climate change.”

“By implementing anti-displacement activities which preserve communities (e.g., people, institutions) they remain connected in times of disaster (i.e. extreme weather events). Not only will people be willing and able to help each other, the infrastructure—government services—will be able to respond and restore services to residents.”

“Creation of a Rainy Day fund, like those created to mitigate urban flooding, could help households who don’t otherwise meet income restrictions for rehab and other assistance.”

¹⁶ Palm Beach County Division of Emergency Management. 2013. Post Disaster Redevelopment Plan Volume 1. <http://discover.pbcgov.org/publicsafety/dem/Publications/Post-Disaster-Redevelopment-Plan.pdf>

¹⁷ Los Angeles County Regional Park and Open Space District. 2018. Grant Administration Manual for Measure A. Available at https://rposd.lacounty.gov/wp-content/uploads/2018/12/DRAFT-Measure-A-Grant-Administration-Manual_2018.10.23.pdf

Engaging with the community in planning is viewed as *very* or *moderately* important by 97% of respondents (Figure 21). Finally, financial and technical assistance for individuals and communities to adequately prepare for, respond to, and recover from extreme events is needed to enable truly climate-resilient communities.



Figure 21. Importance of community engagement in responding to displacement pressures in a changing climate (n=171).

Examples: Capacity Building

- » The “Be A Buddy” outreach campaign in **New York City**, created by the Department of Health and Mental Hygiene, encourages community members to check on vulnerable neighbors, particularly during extreme weather events.⁸

- » The town of **Kinston, North Carolina**, has been subjected to intense flooding from major hurricanes in the last three

decades, damaging or destroying hundreds of homes and causing polluted runoff from the local wastewater treatment plant. FEMA and the state bought out repetitively flooded properties in the 100-year floodplain and the land is now maintained as open space. However, a major challenge emerged for residents seeking to participate in the buyout program as homes outside of the floodplain were typically more expensive. The state created the State Acquisition Relocation Fund, which covered the difference in cost between a new home and the buyout cost, and helped renters relocate from flooded properties. Ninety-seven percent of residents offered a buyout accepted the offer and 90% of them then relocated within Kinston. The success of the buyout program have been mixed as some of the relocated residents could not afford the added costs—insurance, maintenance, taxes—of living in newer, more affluent neighborhoods in Kinston, and had to either default on mortgages or sell their property.¹⁸

- » The **Puyallup Tribe of Indians** prioritized heat waves, changes in air quality, and food-borne illnesses in its climate adaptation plan.¹⁹ A core priority emerging from this planning effort was

“As an organization that strongly believes that most-impacted communities know how to best address their housing needs, investments in leadership development for communities to learn the information they do not know and to discuss them in partnership with experts would be the best move. We firmly believe that a rising tide lifts all boats and when we legislate for the most-impacted we ensure that everyone is protected and positively impacted. Then communities can discuss what they need to do to increase community resiliency to climate change in their own communities. It is critical that legislative bodies back them up by listening to their recommendations or demands and doing what is necessary to make them happen.”

¹⁸ University of North Carolina Institute for the Environment. 2016. Floodplain Buyout Case Study: Kinston, North Carolina. Environmental Law Institute. Available at <https://www.eli.org/research-report/floodplain-buyout-case-study-kinston-nc>

¹⁹ Puyallup Tribe of Indians Climate Change Impact Assessment and Adaptation Options: http://www.puyallup-tribe.com/tempFiles/PuyallupClimateChangeImpactAssessment_2016_FINAL_pages.pdf

ensuring that services provided by critical medical and emergency facilities are consistently available to at-risk populations.

- » The **Bay Area** Regional Health Inequities Initiative (BARHII) partnered with local health departments to address public health and displacement concerns stemming from the 2017 wildfires in Sonoma and Napa counties. BARHII helped to develop a resilience and recovery framework for Sonoma County to help address the environmental, economic, and social effects of such disasters. See the full case study on the work of BARHII on page 38.
- » The Transformative Climate Communities program enables the state of **California** to make significant, targeted local investments. The program provides planning and implementation grants to local communities out of the California Greenhouse Gas Reduction Fund, and is administered by the California Strategic Growth Council. See the full case study on the work of the Greenlining Institute on page 41.
- » The **Atlanta** CREW (Culture-Resilience-Environment-Workforce) project trains community members in green infrastructure construction and maintenance. This community-focused project promotes seeks to benefit communities through workforce development training in green infrastructure implementation, as well as improved health of the local watershed and neighborhood aesthetic improvements. See the full case study on the work of the Southface Institute on page 45.

CASE STUDIES

Case Study: Enterprise Community Partners



Contact: Keegan McChesney, Sustainable Connected Communities Fellow,
kmcchesney@enterprisecommunity.org

Enterprise Community Partners (ECP) is a national nonprofit dedicated to creating opportunities and connections through affordable housing. In collaboration with more than 50 partners in Southern California, ECP tackles issues related to policy, advocacy, and equity. ECP's history is grounded in anti-displacement initiatives that provide affordable housing, funding, and outreach to communities. As a national organization, ECP has developed a series of tools and resources related to green building and developing without gentrification based off of best practices and partnerships. In Los Angeles, where existing risk factors such as homelessness and racial and economic inequities may be exacerbated by climate change impacts, ECP is partnering with local entities on affordable housing, advocating for anti-displacement policies, and building climate-resilient communities.

Affordable Housing: ECP's work at the intersection of affordable housing and climate change is exemplified by their participation in the Los Angeles Regional Open Space and Affordable Housing (LA ROSAH) initiative. LA ROSAH is a group of environmental, open space, affordable housing, and community development organizations such as ECP, Global Green USA, LA THRIVES, Little Tokyo

Service Center, Los Angeles Neighborhood Land Trust, Mujeres de la Tierra, Natural Resource Defense Council, Santa Monica Mountains Conservancy, and the Southeast Asian Community Alliance. LA ROSAH has two overarching goals: (1) to advance policies that prevent green gentrification; and (2) to advance projects that are parks and affordable housing joint developments to show that community health can be improved through urban greening. As part of LA ROSAH's ongoing work, they invite housing developers to pitch projects that integrate parks or open space on planned affordable housing developments. LA ROSAH partners developed the *Pathway to Parks and Affordable Housing Joint Development* report, which brings together examples of and recommendations for displacement-, green infrastructure-, and equitable development-related projects.²⁰ One such project in Los Angeles is the Clifford Beers Housing development, set to be constructed out of shipping containers with the goal of being permanent housing including healthcare services and a public open space containing a “living lung” of greenery to ameliorate local pollution exposure.

In addition, ECP is actively collecting data from affordable housing owners and nonprofits in order to conduct a holistic assessment of the physical and financial needs of these buildings. ECP has also begun to examine the energy and water systems of affordable housing to determine each development's exposure to flooding, fires, and extreme heat events. For example, ECP has developed a series of guiding criteria called Enterprise Green Communities,²¹ which affordable housing developers can use as a parallel to the LEED certification process. ECP is updating these criteria to include climate resilience. In addition, ECP has developed a Portfolio Resilience Tool, which allows owners of affordable housing to obtain risk scores (e.g., fire, flood, sea level rise, extreme heat, local vulnerability) for their properties. This tool helps owners identify where improvements are needed and provides links to resources for financial aid.

Advocating for Anti-Displacement Policies: ECP is also involved in policy change and development as it concerns affordable housing and equity concerns. A major accomplishment for ECP's policy advocacy work in Los Angeles was the inclusion of anti-displacement provisions in the Safe, Clean Neighborhood Parks, Open Space, Beaches, Rivers Protection and Water Conservation Measure (Measure A), which will provide billions of dollars for new parks in the next decade. The Measure A Grant Administration Manual, approved by the County Board of Supervisors in March 2019, provides guidelines to avoid displacement and scoring criteria that evaluates applications for new parks based on multiple criteria, including potential displacement.¹⁷ Provisions include that affordable housing developers can apply for funds for the joint development of parks and housing.

²⁰ Pathway to Parks & Affordable Housing Joint Development: https://d3n8a8pro7vnm.cloudfront.net/lathrives/pages/172/attachments/original/1541797472/Pathway_to_Parks_and_Affordable_Housing.pdf?1541797472

²¹ Green Communities Criteria: <https://www.enterprisecommunity.org/solutions-and-innovation/green-communities>

Recent efforts to revitalize the 51-mile corridor of the Los Angeles River in order to create healthy communities has put additional stress on the existing vulnerabilities of the region.²² Some of the unintentional consequences of this project to date include increased property values and rent prices, which many fear may lead to the displacement of individuals and communities. ECP and other community advocates, led largely by the Southeast Asian Community Alliance, are working to get ahead of the potential displacement and green gentrification impacts of the projects included in the city's Los Angeles River Revitalization Master Plan through advocacy and outreach efforts.

Building Climate-Resilient Communities: After Hurricane Katrina devastated the coasts of Louisiana and Florida in 2005, ECP became involved in developing resilience and recovery strategies for at-risk communities. ECP's Equitable Climate Resilience Initiative focuses on the recovery and resilience building of communities impacted by natural disasters. As a result of Hurricane Maria in 2017, ECP has been involved in recovery efforts in Puerto Rico, the U.S. Virgin Islands, and the Florida Keys. As a housing development organization, ECP is working to rebuild areas on the islands in ways that promote climate adaptation and community resilience. A result of this work is *Keep Safe: A Guide to Resilient Communities in Puerto Rico and the Virgin Islands*,²³ a book detailing practical design and construction guidance for rebuilding climate-resilient communities while avoiding massive damage and displacement that is relevant to other vulnerable communities.

Case Study: Bay Area Regional Health Inequities Initiative



Contact: Will Dominie, Policy Manager of Housing and Equitable Development, WDominie@barhii.org; Matt Vander Sluis, Climate Change and Community Resilience Health Equity Impact Manager, MVanderSluis@barhii.org

The Bay Area Health Inequities Initiative (BARHII) is a coalition of local public health departments in the San Francisco Bay Area, including representation from Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma counties, as well as the City of Berkeley. Their programmatic work spans the affordability of housing, displacement risks, immigration, racial equity, climate resilience, and health equity policy. A major challenge of the type of initiatives BARHII conducts is that many communities are experiencing multiple pressures at once (e.g., housing crisis, climate change, health inequities). Bay Area communities are being displaced by the ongoing housing crisis and are moving to or stuck in locations that are no longer appropriate due

²² Los Angeles River Revitalization: <http://lariver.org/>

²³ Keep Safe: A Guide for Resilience Housing Design in Island Communities: <https://www.enterprisecommunity.org/solutions-and-innovation/disaster-recovery-and-rebuilding/keepsafe>

to climate risks (e.g., sea level rise, fire hazard zones). BARHII and the state overall are also facing the challenge of dealing with the insurance crisis as a result of several seasons of cataclysmic fires. While this heavily impacts low-income households, it is possible that the Bay Area will see an increase in displacement overall as residents are pushed out of neighborhoods due to housing costs and insurance rate inflation. The challenge is how organizations such as BARHII can work to address these issues without letting the insurance market dictate migration patterns and displacement from fires and other climate-related events. BARHII is involved in multiple efforts in the Bay Area that aim to specifically tackle climate equity and development planning through public awareness campaigns, community engagement efforts, and climate policy and investment analyses.

Raising Public Awareness: BARHII worked with multiple LHDs and the North Bay Organizing Project to address health and displacement concerns after four destructive wildfires occurred in Sonoma and Napa counties in 2017. The fires pushed homeowners out of their communities and as recovery efforts began, homeowners moved into spaces previously occupied by renters. As vacancy rates went down and housing prices went up due to increased demand, many residents were squeezed out of the North Bay area by either economic factors or the physical and structural impacts of the fires. BARHII's role in addressing this issue has been through documenting impacts and preparing LHDs and communities for future fire events. In Sonoma County, BARHII helped to develop a resilience and recovery framework, embedding equity in strategies to address displacement and housing shortages.²⁴ For example, the framework calls for rebuilding fire-damaged properties, the prioritization of transit-oriented development, increased availability of affordable housing units, and evaluating if county-owned properties are appropriate for housing development. In addition, BARHII developed a Fire Recovery Brief, which includes recommendations for local jurisdictions preparing for such disasters.²⁵ The brief highlights how the fires exacerbated the existing housing crisis in the area via increases in rent, insurance rates, and home prices, and vacancy rates.

BARHII also developed a brief in 2017 that explicitly links housing insecurity and displacement issues to public health.²⁶ For example, low-income families may have to choose between affordable housing and medical costs. The brief also shares strategies to create “healthy housing,” including protecting existing residents, preserving affordable housing, producing new mixed-income housing units, encouraging community participation in decision-making, and developing housing near transit, workplaces, and critical services.

²⁴ Sonoma County. 2018. Sonoma County Recovery & Resiliency Framework. Available at <https://sonomacounty.ca.gov/Office-of-Recovery-and-Resiliency/Recovery-Framework/>

²⁵ Health Equity in the North Bay Fires Recovery Process: A Focus on Low-Income and Immigrant Community Needs: <https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Ausc%3A98072560-1789-4ef1-b9c8-d3c66718677b>

²⁶ Housing Insecurity and Displacement in the Bay Area: <http://barhii.org/wp-content/uploads/2017/10/BARHII-Displacement-Brief.pdf>

Engaging Community Members: BARHII is also collaborating with the San Francisco Bay Conservation and Development Commission (BCDC) on the Adapting to Rising Tides (ART) project.²⁷ Through community engagement and organization, research, and collaboration action planning, BARHII and BCDC are working to build resilience and combat sea level rise while promoting healthy communities and anti-displacement methods. BARHII and the BCDC are working alongside community members in the Bay Area to co-design adaptation strategies and engagement processes²⁸ that address the threat of sea level rise in the region. In addition to community engagement, BARHII and BCDC are studying pertinent societal factors and facilitators of displacement (e.g., flooding, housing insecurities, regional growth without equitable distribution of profits) to develop a course of action for community adaptation to sea level rise threats.²⁹ The ART approach emphasizes collaborative design, transparency, and sustainability in society and equity, economy, environment, and governance. ART's website contains many regional-, local-, and sector-specific projects, reports, and resources that address the associated housing and transportation impacts of climate change events such as sea level rise. For example, Contra Costa County evaluated the vulnerability of local assets such as transportation routes and public utilities to sea level rise and determined incentives or mandates are needed to ensure that flood protection measures are prioritized in retrofits and new developments.³⁰

Analyzing Climate Policies and Investments: BARHII is working with LHDs to examine California's current climate investment laws that are meant to help low-income communities. The goal is to ensure actions stemming from these investments do not have displacement consequences. Specifically, Assembly Bill No. 1232,³¹ passed in October 2019, calls for affordable housing and weatherization programs meant to combat climate change impacts such as extreme weather events and promote the reduction of greenhouse gas emissions. The bill calls for an examination of weatherization investments and grants provided to improve low-income households to see if they may be causes of displacement. BARHII is still in the research and data acquisition phase of their investigation; however, the results of this research will provide data-backed information on the displacement-related consequences of climate adaptation and mitigation efforts. In addition, a BARHII member, the Contra Costa Health Department, is in the process of a pilot study to target energy-efficient investments in communities where both homes and residents have strong health and climate needs. For example, they are targeting areas where people are having trouble paying their energy bills and rent due to these climate investment strategies, and also residents whose

²⁷ Adapting to Rising Tides: <http://www.adaptingtorisingtides.org>

²⁸ Stakeholder Engagement: Adapting to Rising Tides Program: http://www.adaptingtorisingtides.org/wp-content/uploads/2015/10/ART-GPG-StakeholderEngagement_web-aligned_V1.pdf

²⁹ Social Determinants of Health Indicator Guide: <http://barhii.org/resources/sdoh-indicator-guide/>

³⁰ Contra Costa County ART Project: <https://www.adaptingtorisingtides.org/project/contra-costa-county-adapting-to-rising-tides-project/>

³¹ Assembly Bill No. 1232: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB1232

health conditions may be exacerbated by climate change (e.g., extreme heat), leading to possible displacement. The study is currently investigating 12 homes and BARHII aims to scale-up these efforts by extending the reach of the research to encompass housing cost burdens, health needs, and climate vulnerabilities.

Case Study: The Greenlining Institute



Contact: Emi Wang, Environmental Equity Senior Policy Manager, emiw@greenlining.org

The Greenlining Institute (GLI) is a nonprofit organization founded to advance economic opportunity and community empowerment through policy, research, organizing, and leadership throughout California. GLI's work can be split up into five themes of equity—health, economics, energy, environment, and technology. The Environmental Equity team works to address pollution and poverty while ensuring that any investments or adjustments made as a result of their projects take into consideration community input in decision making and anti-displacement strategies. One of the major initiatives of GLI and its partners—California Climate Investments, California Department of Conservation, and the California Strategic Growth Council—is the Transformative Climate Communities (TCC) program.³²

The TCC program was developed as a place-based approach to allow the state to make significant, targeted investments that meet multiple needs of burdened communities. It also empowers communities to tackle climate change and equity challenges at a neighborhood scale. Within TCC, funded communities propose solutions to address each neighborhood's specific needs and assets (e.g., addressing climate mitigation through greenhouse gas reduction goals). TCC includes Planning Grants, which fund planning activities to prepare communities for future funding opportunities that align with TCC's objectives, and Implementation Grants, which fund neighborhood-level projects. TCC is funded out of the California Greenhouse Gas Reduction Fund and is administered by the California Strategic Growth Council.

TCC is unique in that it not only contains application requirements for climate adaptation and mitigation, but also requires that applicants complete a Displacement Avoidance Plan. Each plan must contain: (1) a description of the displacement vulnerability a project addresses as well as what vulnerability looks like in the neighborhood or community where the project is taking place; (2) policies or ordinances that are already in place to prevent displacement in the community; and (3) the identification of new policies ranging from housing preservation to tenant protection and

³² Transformative Climate Communities: Community-led transformation for a sustainable California: http://sgc.ca.gov/programs/tcc/docs/20190204-Facts_Sheet_TCC.pdf

business support that could prevent the displacement of low-income households and local businesses.

The first round of TCC grantees—TransformFresno,³³ Ontario Together,³⁴ and Watts Rising Collaborative³⁵—have recently entered into the implementation stage (year three) of the five-year program. For example, Ontario Together was awarded \$35 million for the Vista Verde affordable housing development, construction of a 5-mile bicycle/pedestrian trail, improved public bus service, an expanded urban forest, low-income housing weatherization including solar installations, health education campaigns, and workforce development. To date, the Vista Verde Apartments are under construction and progress has been made on the trails, bus service improvements, and the establishment of a San Bernardino County Workforce Development office. The second round of grantees include the Community Partners' Green Together initiative³⁶ and the Sacramento Housing and Redevelopment Agency's Integrated Multimodal Place-based Living project.³⁷ The strategic plan of Green Together incorporates urban greening, mobility enhancement projects, and displacement avoidance policies in Pacoima, a neighborhood in the San Fernando Valley. The guidelines for round three of the TCC program were released in October 2019. Round three includes \$56,400,000 for two Implementation Grant awards and \$600,000 for three Planning Grant awards.

GLI is working through TCC to bring a focus to community infrastructure in the climate change adaptation space. There are challenges to this, however, including unintentional trickle-down effects of projects that increase green spaces while simultaneously increasing surrounding property values and causing the displacement of lower-income residents. Current best practices for these types of projects are those which are accompanied by affordable housing development, job creation, workforce development, and small business support and protection. In order to address the challenges of climate-related anti-displacement initiatives, communities, community leaders, and practitioners need to be thinking in a multi-issue, holistic, and collaborative way that includes the perspectives and concerns of various community sectors and stakeholders.

There are not current quantitative data to measure the effectiveness of the TCC program and its displacement requirements. However, through narrative accounts, the policy does seem to be groundbreaking in the multi-sector integration of climate change and displacement issues. The UCLA Luskin Center has been contracted to do the evaluation and monitoring of the TCC-funded projects. The Center is tracking the projects throughout their five-year lifecycle as well as final evaluations for

³³ TransForm Fresno: <http://www.transformfresno.com>

³⁴ Ontario Together: <http://www.ontariotogether.com>

³⁵ Watts Rising Collaborative: <http://www.caclimateinvestments.ca.gov/2019-profiles/tcc>

³⁶ Community Partners' Green Together: <https://communitypartners.org/grantmakers/green-together-northeast-valley>

³⁷ Sacramento Integrated Multimodal Place-based Living Project: <https://www.sacramentopromisezone.org/simpl>

each project. The Center will release interim reports as well as a final survey for applicants at the end of the five-year funding period.

Case Study: Partnership for Southern Equity



Contact: Kirsten Cook, Just Growth Portfolio Manager, kcook@psequity.org

The Partnership for Southern Equity (PSE) is working with local partners and community members in the Atlanta metropolitan area to address inequities and displacement caused by increasing development and climate-related pressures. The major climate change impacts of concern in Atlanta are flooding, drought, extreme heat, and degraded water quality.³⁸ Historically marginalized communities have received the brunt of the city's major flooding impacts and displacement. PSE is working to address Atlanta's vulnerabilities through advancing policies and institutional actions that promote racial equity and shared prosperity. PSE's programmatic work is divided into four issue portfolios—growth, health, energy, and opportunity. While these four portfolios occasionally overlap, the Just Growth³⁹ and Just Energy⁴⁰ portfolios are often joined in initiatives related to climate justice and equitable growth and development. Major capacity building efforts of PSE include investments in leadership development, community engagement, local partnerships, and technical assistance.

Leadership Development: PSE is involved in many leadership development efforts in Atlanta as a TransFormation Alliance⁴¹ member. PSE runs the TransFormation Academy for community leaders to learn about how they can be involved in transit planning and advocating for affordability and the preservation of their own homes and communities. Participants also learn about synergies between jobs, health, climate, arts and culture, and transit-oriented development. These efforts emphasize anti-displacement education and strategies. PSE also hosts learning workshops (e.g., in October 2019, PSE hosted a workshop about race and green gentrification for SPARCC affiliates) and is actively working to foster partnerships to address climate change and displacement issues.

Community Engagement: PSE's anti-displacement and development-oriented projects prioritize climate impacts such as heat islands caused by extreme heat and stormwater management

³⁸ What Climate Change Means for Georgia: <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-ga.pdf>

³⁹ PSE Just Growth: <https://sites.google.com/view/justgrowth>

⁴⁰ PSE Just Energy: <https://psequity.org/just-energy/>

⁴¹ TransFormation Alliance: <https://atltransformationalliance.org>

practices necessary to alleviate damage from flooding. PSE makes sure that their efforts are led with input from community members. The Just Growth portfolio, for example, provides a platform for residents that need support with work related to affordable housing development and anti-displacement capacity building. PSE has also been working with the U.S. Water Alliance on a Water Equity Task Force⁴² with five other cities (Cleveland, OH; Milwaukee, WI; Buffalo, NY; Louisville, KY; and Camden, NJ) to develop an equity roadmap. This effort teams PSE with the Department of Watershed Management and other community partners in Atlanta to improve stormwater management and green infrastructure implementation in a way that will not displace or otherwise negatively affect residents.

Local Partnerships: The Equitable Growth Impact Zone is an initiative co-led by PSE and a local mission-based developer, the Historic District Development Corporation (HDDC).⁴³ The goal is to create an equity district in the metropolitan area to combat several challenges such as transit, development, arts and culture, climate justice, health equity, job access, and affordable housing simultaneously. The partners are looking to infuse elements of environmentally and economically sustainable infrastructure into neighborhood economies through development and input from residents. An example of this effort is in Atlanta's Sweet Auburn Area, one of the city's most historically significant neighborhoods.⁴⁴ This area is known for its pre-Civil Rights era concentration of black-owned businesses, and suffered significant decline after the desegregation of the city and construction of the interstate, which split the neighborhood in half. Sweet Auburn now faces gentrification as development pressures on all sides of the district threaten to accelerate the erosion of the historic fabric of the neighborhood. PSE is engaged with neighborhood residents to ensure that the first development project they implement is planned by community members rather than a profit-driven developer. The first planned project in this area is a mixed-use design development initiative for a historically black funeral home.

PSE is also moving forward in efforts considering transit-oriented development and strategies to reduce carbon emissions. PSE focuses on connecting communities and increasing quality of life through their Equitable Transit-Oriented Development program.¹¹ For example, they are working with the Atlanta Regional Commission to engage communities in transportation planning and understanding the transit needs of Atlanta so that the city can become less car-dependent while avoiding displacement.

The Just Growth Circle, a collaboration between PSE and Climate Interactive,⁴⁵ is a network of businesses, politicians, nonprofits, academics, and community members in the Atlanta metropolitan area. The network is a community of practice focused on sharing lessons learned and advancing

⁴² Water Equity Task Force: <https://sites.google.com/view/justgrowth/water-equity-task-force?authuser=0>

⁴³ Historic District Development Corporation: <https://hddc.org>

⁴⁴ Sweet Auburn: <https://www.nps.gov/nr/travel/atlanta/aub.htm>

⁴⁵ Climate Interactive: <https://www.climateinteractive.org>

equitable development in the South. Some of the members include American Rivers, Atlanta Land Trust, Earth Share Georgia, Eco-Action, Mercy Housing, and the West Atlanta Watershed Alliance.

Technical Assistance: PSE works with local governments in the Atlanta metropolitan area to write equitable strategic plans, taking into account factors such as housing, displacement, and affordability. PSE also recognized the need for a tool to aid developers in fully engaging residents to make each step of the development process simpler and more equitable. Currently, there is not much incentive for developers to incorporate equity considerations because it takes time and can be expensive. PSE's Equitable Development Implementation Tool integrates community needs with development projects in order to address the Just Growth Circle values of anticipating and protecting against displacement, strengthening communities, and healing environmental injustices. Through this tool, PSE is looking to address inequities in the responses and strategies of climate adaptation and mitigation projects in Atlanta. The tool covers every stage from the planning, permitting, construction, and the final occupation and use of a developed structure. Because the tool needs to be responsive and flexible to various circumstances, PSE is using local data hubs to incorporate dynamic and current local data. PSE is piloting the tool with the HDDC in the Equitable Growth Impact Zone, and it will continue to be modified in 2020 with input from local community members. PSE will continue conducting Just Growth Circle meetings to receive feedback from members on what type of tool is needed and how the tool can become a reality.

Case Study: Southface Institute



Contact: Alex Trachtenberg, Senior Project Manager, Policy and Community Impact, atrachtenberg@southface.org

The Southface Institute (SFI), located in Atlanta, Georgia, promotes sustainable homes, workplaces, and communities through education, research, advocacy, and technical assistance. Major climate change threats to Atlanta include extreme heat, changes in precipitation, extreme weather, and flooding.⁴⁶ These impacts have consequences for Atlanta's residents, particularly when it comes to stormwater management, water quality and supply, and various public health concerns (e.g., heat-related illness and water-borne disease). While there have been efforts to address these concerns, some have led to the unintentional displacement of socially vulnerable, low-income, or frontline communities (e.g., the Atlanta Beltline⁴⁶). SFI, a nonprofit with 40 years of experience working in Atlanta, is trying to change the way the development and redevelopment of Atlanta is happening by integrating communities' sense of place and environmental consequences into planning and action. SFI is using community engagement, communication, and outreach to implement green

⁴⁶ Atlanta Beltline: <https://beltline.org/the-project/>

infrastructure projects, aid in workforce development, and ameliorate displacement pressures in Atlanta's southwest region.

SFI is the climate lead for the TransFormation Alliance in Atlanta. As part of the TransFormation Alliance, SFI provides leadership concerning the advancement of climate resilience in relation to key development, anti-displacement, and affordable housing opportunities. To enhance their work and to better understand how climate resilience is being paired with development, SFI partnered with Enterprise Community Partners on the Climate and Cultural Resilience Project (C&CR). SFI is using knowledge gained from C&CR, particularly around creative spacemaking tools, to inform the development of the Atlanta CREW (Culture-Resilience-Environment-Workforce) project.⁴⁷ CREW began at the start of 2019 and receives its current funding from the C&CR initiative. CREW focuses on green infrastructure, bioretention, workforce development training, and implementation practices within the Utoy Creek Watershed in Atlanta. The community-focused project promotes the improvement of local residents' quality of life and seeks to benefit communities through real-world training in green infrastructure implementation, opportunities to learn how to alleviate the effects of stormwater flooding, improved health of the local watershed due to decreased flooding and polluted runoff, and neighborhood aesthetic improvements.

SFI aims to address existing environmental and social challenges and focus on economic, workforce, and environmental opportunities identified through C&CR work led by SFI's Green Infrastructure Workforce Development Program. A large component of CREW is community outreach, promoting community ownership, and hands-on training. Through CREW, SFI conducts educational workshops focusing on local ecology, stormwater challenges, watershed dynamics, management techniques, and green infrastructure, as well as issues of displacement and equity. CREW uses participatory research to survey the Utoy Watershed and threats to infrastructure in low-lying areas that are prone to flooding. These surveys are compared with city actions to assess the watershed and create priority sites for green infrastructure implementation. These sites provide added community benefits including improved stormwater management, access to green space, green infrastructure education, and safety.

CREW workshops contain around 15 people per training session and all trainees complete Green Infrastructure and Resilience Institute (GIRI) Installation and Operations and Maintenance (O&M) courses.⁴⁸ As part of the training, participants support six green infrastructure implementation projects and creative placemaking projects in the watershed. Trainees are also connected to job opportunities with SFI's employer network. SFI want to not only train participants but assist in reframing how green infrastructure and stormwater management are viewed in Atlanta's communities. As of October 2019, four training cohorts have gone through CREW's workshops. The goal is to have six cohort groups trained by May 2020. SFI conducts pre- and post- training focus

⁴⁷ Atlanta CREW Brief: <https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Aascds%3AUS%3A234a5354-924e-4fb5-8148-d35c563614a1>

⁴⁸ Green Infrastructure and Resilience Institute: <https://www.southface.org/programs/giri/>

groups with each cohort with the assistance of a public health and planning researcher. The results of these surveys will be available at the end of the project. SFI plans on releasing a case study and full report detailing the results of the CREW project in mid- to late-2020. To date, the challenges SFI has experienced while working in predominantly low-income frontline communities are due not only to environmental factors that exacerbate displacement, development, and economics, but also the lack of economic opportunity and mobility in these areas.

Overall, the public reception to the CREW initiative in Atlanta's southwest region has been positive. SFI's emphasis on community engagement and outreach to local associations, nonprofits, and neighborhood planning units has allowed SFI to create trusted partnerships in the area. SFI is continuously in contact with these organizations on projects' progress and potential locations for future installations of green infrastructure. SFI has also worked with local arts organizations and the West Atlanta Watershed Alliance to elevate community representation in conversations about development and redevelopment in Atlanta. Through these efforts, SFI and its partners seek to better represent local history, identity, and culture while connecting projects to environmental and climate challenges with equitable solutions.

The first part of the paper discusses the importance of the research and the objectives of the study. It then presents a literature review of the existing research on the topic. The second part of the paper describes the methodology used in the study, including the data collection and analysis techniques. The third part of the paper presents the results of the study, and the fourth part discusses the conclusions and implications of the findings.

The study was conducted using a quantitative research design. Data was collected from a sample of 100 participants using a survey questionnaire. The data was then analyzed using statistical software to determine the relationships between the variables of interest.

The results of the study indicate that there is a significant positive relationship between the variables of interest. This finding is consistent with the previous research in the field. The implications of these findings suggest that the variables of interest are important factors in the study of the topic.

In conclusion, the study has shown that the variables of interest are important factors in the study of the topic. The findings of the study have implications for future research in the field.