

Seeding Climate Resilience Through Equitable Investment

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Preface

If, as Ian Galloway and Elizabeth Mattiuzi of the Federal Reserve Bank of San Francisco suggest, *housing policy is climate policy*, then community development, as the driver of affordable housing production, is really climate policy. It is becoming increasingly apparent that how and where we build shapes the climate risks communities face, and that the future sustainability of infrastructure investments will be shaped by climate risks and benefits. One consequence of our long national history of inequitable development and disinvestment is that climate risks and benefits are unevenly distributed across the United States. Acknowledging the link between community development and climate change is therefore essential to equitable development. As advocates of equitable investment, we believe that the community investment field should be at the forefront of shaping climate policy and practice.

Many of the people currently confronting climate risks live in low-income communities and communities of color. The specific risks these communities face are being identified and handled as they arise, as separate challenges. However, they share a common underlying dynamic. Recognizing that fact is essential if we are to devise strategies for climate resilience with the scale and impact that are required. This paper is an attempt to highlight these strategies so that community investment stakeholders can deploy them as they incorporate climate change into their work. The stories in the following pages reflect the diverse ways that community investment is shaping the distribution of climate risks and benefits across the country. Together they point to the urgency of acting now—and acting strategically—to ensure an equitable future.

Robin Hacke

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Photo Credit: Nirutft

Introduction

Over the last year, the United States has experienced unprecedented wildfires, ice storms, hurricanes, and flooding, exposing communities to fatalities, displacement, and property damage. According to NOAA’s 2020 report, last year the United States experienced 22 separate billion-dollar weather and climate disasters, costing “a combined \$95 billion in damages.” As is generally true, the impacts of these events have been disproportionately felt by low-income communities and communities of color.

Despite the unabated acceleration of climate events, our national response has largely centered on disaster recovery, treating each event as an unrelated and unpredictable disaster. The costs of the failure to address our increasing climate risks holistically are more than just financial; they are existential. A key element of shifting our approach will be focusing on climate-resilient investment, that is, investments that support both adaptation and mitigation in an equitable manner.¹

Even for many who accept that climate change is real, investing in climate resilience still seems risky, complicated, and expensive, given the unknown future ahead. This leads to what Mark Carney, former governor of the Bank of England calls the “tragedy of the horizon.” In a 2015 speech on climate change and financial stability, Carney noted that one of the big problems with climate change is that it imposes “a cost on future generations that the current generation has no direct incentive to fix.”

¹ We follow The Kresge Foundation in defining climate resilience as strategies that include climate adaptation and mitigation while fostering social cohesion.

The tragedy of the horizon is compounded by the uneven distribution of climate risks across the population and by the fact that communities with the greatest incentives to address those risks are underrepresented in making decisions about investments.² In the context of financial incentives, Carney notes that even though preventative action is cheaper, our financial systems are not set up to encourage the types of climate-resilient investments on which our future survival depends. But not investing in climate resilience is more expensive and will only become exponentially more so with time.

While the Biden administration has signaled a commitment to taking climate change seriously, up until now there has not been consistent federal support for investing in climate resilience. Without coordinated federal action, climate resilience has become an elusive amenity that affluent communities can access while low-income communities face increasing exposure to a host of negative climate impacts. It is therefore not surprising that the costs and burdens associated with climate change are being disproportionately borne by low-income communities and communities of color.

Unless climate investments have an explicit focus on benefiting communities of color and places of historic disinvestment, they will add another layer of climate-based displacement and exclusion to existing inequities. The perception of climate resilience is already driving up housing prices in specific areas, and future investments in resilience could accelerate this trend, leading to a new wave of climate displacement. Until all communities are climate resilient, we need to focus on bringing resources to disinvested communities and enabling communities to own and shape those investments, so that climate risks and benefits are equitably distributed.

Fortunately, across a variety of communities, equitable climate-resilient investments are already happening. Many communities are grappling with how to marshal resources toward climate resilience and how to distribute positive climate-related investment equitably. As early adopters and innovators, they are setting the path for processes and decisions that all communities will need to face. What follows are six case studies of such communities that exemplify the wide range of investments being made to support equitable climate resilience. The strategies and technologies they illustrate include climate migration, green stormwater infrastructure, community scale microgrids, home climate retrofits, fire risk mitigation, and climate-resilient housing development.

Each of the case studies provides proof of concept for at least one type of climate-resilient investment. While each is unique, together they illustrate some shared insights for the work ahead:

1. Most of these projects were driven by community initiative, ensuring a process where decision-making and economic benefits are in the hands of local residents.
2. New governance structures and effective multi-sector collaboration facilitated most of these projects.
3. Many of these projects involved a new practice or technology with risky or unknown outcomes, which made the use of public funds and philanthropy essential to their success.
4. Many of the projects have opened new markets for lending because they proved the viability of innovative investments.

Investments in climate resilience are essential to ensuring that current and future community development is sustainable, equitable, and economically viable. Because the climate risks faced by low-income communities and communities of color are closely connected to historical patterns of neglect, the same principles around inclusive planning, collaboration, and financial innovation that characterize the best of community development should be applied to investments in climate resilience.

² In *The Sum of Us* (New York: Random House, 2021), Heather McGee notes that “white people in America are much less likely than people of color to rank environmental problems as a pressing concern” (198).

Staten Island Managed Retreat

Community-Driven Decision-Making

Before 2012 when Hurricane Sandy hit, the residents of Oakwood Beach were primarily homeowners who had lived in the area for generations, like many other predominantly white working-class communities in Staten Island. By the end of 2013, they were piloting New York State's first urban managed retreat project.³ Oakwood Beach was a small tight-knit coastal neighborhood on the South Shore of Staten Island. The South Shore was once part of the wide tidal salt marsh meadows that were filled in to allow for development, which eliminated the island's natural buffer against flooding. Without this buffer, the region became prone to flooding.

While the damage of Hurricane Sandy was felt by residents throughout New York, Staten Island was hit especially hard. Forty-three of the 53 people who died when the storm hit the city lived in Staten Island. The communities in the South Shore had dealt with ongoing flooding and sewage problems for years, going so far as to form the Oakwood Beach Flood Victims Committee to study flooding and advocate for coastal protection in the aftermath of a hurricane that hit the community in 1992. In 1993, a sense that New York City did not care about the residents of Staten Island led them to pass a non-binding referendum on secession by a 2-1 margin.

After Hurricane Sandy hit, the mayor of New York announced the "Build it Back" program to provide rebuilding support for families whose homes had been destroyed. But rather than rebuilding, the residents of Oakwood Beach opted to move. As the community met in the wake of the hurricane, some of the original members of the Flood Victims Committee brought up a buyout, which had originally been raised in 1992. This time, they found widespread support for the idea. The newly formed Oakwood Beach Buyout Committee began researching options and talking to local politicians.

When the committee first approached the city about relocation, they were met with resistance. Both Mayor Bloomberg and Senator Charles Schumer were strongly opposed. "We cannot and will not abandon our waterfront," said Bloomberg. When it was clear that New York City would not support the buyout program, the committee went to the governor. As a result of their efforts, on February 26, 2013, Governor Cuomo announced the pilot of a home buyout program in Oakwood Beach. The program would focus on areas that 1) had a high level of consensus for participating in a buyout, 2) were located in state-designated high flood risk zones, 3) had a history of chronic flooding, and 4) had sustained damage from Hurricane Sandy.

Once Governor Cuomo announced his support for the Oakwood Beach buyout, seven other neighborhoods began organizing for their own buyouts. Cuomo's swift support for relocation was unusual (and may have been related to tensions between the mayor and the governor). While there are many reasons for local leaders to oppose climate migration, the specter of lost property values is significant and can also make states more supportive than local governments.

³ The term managed retreat has been used to refer to the coastal management strategy of moving inland from the shore and is now used to refer to strategies for relocating away from climate risks. However, the term has been criticized for glossing over the coercive history of forced displacement, particularly for communities of color. For many climate advocates, "supported relocation" or "climate migration" are now preferred terms. Because the relocation in Staten Island was characterized as managed retreat at the time and after, we use both terms in this paper. For further discussion of the politics of retreat and Oakwood Beach, see Lisa Koslov, "The Case for Retreat" (Public Culture 2016).

Less than three years after Hurricane Sandy, 99% of the residents of Oakwood had participated in the buyout program. One year later, the Governor's Office of Storm Recovery offered to buy 107 properties in Ocean Breeze and 122 properties in Graham Beach for a total of \$86 million dollars. Altogether, the State has spent \$255 million dollars to buy 654 properties, most of them in Staten Island. At the same time, since Hurricane Sandy, the city has continued to move forward on new developments along the waterfront in Williamsburg, Long Island City, and Hallat's Point, all of which were underwater during Sandy. This indicates the absence of a consistent strategy for resilient development.



*Fox Lane in Oakwood Beach, Staten Island May 2014
Photo Credit: Robin Michals*

The community in Oakwood Beach was predominantly homeowners, many of whom had lived in the area for generations and understood Sandy not as a one-time event or even an expression of increasing storm risk due to climate change, but as the most recent in a series of battles with flooding embedded in the development of the area.

Financing

In 2013, Governor Cuomo pledged \$200 million to a state-funded buyout program to relocate residents in state-designated high flood risk areas like Oakwood Beach. The enhanced buyouts meant the government would pay pre-storm prices for the homes and then knock them down, returning the area to its pre-development wetland state. The Governor's Office of Storm Recovery (GOSR), which was created in the wake of Hurricane Sandy to ensure a more coordinated and efficient disaster response, provided and managed funds for the Oakwood, Ocean Breeze, and Graham Beach buyouts. GOSR relies on a variety of federal funding sources including Federal Emergency Management Agency (FEMA), Community Development Block Grant Disaster Recovery, and the Department of Agriculture, as well as state resources and New York City's Build It Back program.

What made this work?

The community in Oakwood Beach consisted predominantly of homeowners, many of whose families had lived in the area for generations. They understood Hurricane Sandy not as a one-time event or even an expression of increasing storm risk due to climate change, but as the most recent in a series of battles with flooding that were embedded in the development of the area. This history likely helped residents decide they were interested in relocation before it was suggested to them, which in turn gave them a sense of agency. In their 2016 report on buyout programs, the Lincoln Institute of Land Policy notes that "most successful buyouts began as community efforts."

Two primary forces made the decision to relocate palatable to Oakwood Beach residents. First was the knowledge that their homes would not be torn down in order to build luxury homes. Second was the sense that by agreeing to relocate, they would be making other parts of Staten Island safer. The open space of Oakwood would serve as a buffer, protecting residents further inland and making their homes more resilient to future flood risks. The city's Build It Back buyout program allowed the land to be redeveloped, which residents opposed. The knowledge that instead all structures would be demolished and returned to open space made residents feel like they were contributing something meaningful to the larger community.

As homeowners, residents of Oakwood could use the money from the sales of their homes to relocate elsewhere. In addition to agreeing to pay pre-hurricane value, the buyout program provided incentives of 10% of pre-hurricane value for participants who relocated to an enhanced buyout area on Staten Island and 5% for participants who relocated within the same city or county. These incentives reflected the desire of the city and state to retain the financial benefits of new property sales, but they also allowed residents to retain community connections as they moved. Many have chosen to buy homes near each other in other parts of the city or outside the state.

The speed with which the state was able to move millions of dollars into the hands of eligible households combined with the fact that most of the residents were homeowners stands out in comparison to other managed retreat programs. Part of this rapid pace was due to the federal declaration of major disaster, but even with that declaration, other neighborhoods that were not offered a buyout immediately after Hurricane Sandy could not reach consensus because they had already moved or invested in rebuilding.



*Home on Kissam Avenue that is still occupied as of July 2017
Photo Credit: Robin Michals*

Other Communities

While programs that support climate migration can play an important role in climate adaptation and mitigation, they pose a series of logistical challenges and run the risk of reinforcing social inequity if they are not strategically designed and implemented. Many of these challenges have been visible in Harris County, Texas, which has one of the largest buyout programs in the country.

Progress in Harris County, whose program began in 1985 and is managed by the Harris County Flood Control District, has been slow and uneven. A 2017 ProPublica analysis estimated that at current rates, it would take a decade to acquire the properties on the priority buyout list at that time. Meanwhile, the area covered by the program excludes thousands of additional homes that continue to flood.

After Hurricane Harvey damaged 8,750 homes in 2017, 4,000 residents sought buyouts in Cypress Creek. Of these, 1,100 were considered eligible, but in the subsequent three years, only 106 homes were purchased. The inadequate scale of response reflects a lack of clarity about buyout criteria, lack of resources, and lack of urgency. It is also worth noting that Harris County is a predominantly non-white community with one of the highest property tax rates in the country, despite the fact that 20% of households live below the poverty line.

As with the buyouts in Staten Island, Harris County buyouts require properties to become green space, which local officials see as a threat to tax revenue. Unlike New York State, Texas has not intervened to support the local buyout program. In the absence of strong government support, many homeowners end up selling their properties to investors who take advantage of their desperation to buy the homes for cheap, then renovate and resell to families willing to risk flooding for homes they can afford.

While lack of funding and slow progress have stymied climate migration in Harris County, the speed and funding access of one of the most comprehensive managed retreats in Illinois stands at the other end of the spectrum. In 1993, two floods hit the town of Valmeyer, Illinois, destroying many homes and businesses. With general consensus from the community, the city used FEMA and state funds to buy 300 homes and 25 businesses in the floodplain, allowing residents to rebuild on a nearby bluff that is 400 feet higher than the old town. Within two years, 700 of the 900 people who lived in Valmeyer had relocated to the new location. Today, the city population has grown to 1,300.

While a relocation of a similar distance took place in Odanah, Wisconsin, it took that community 30 years to move a few miles away from the Bad River floodplain. The residents of Odanah are members of the Chippewa tribe and experienced forced migration to the banks of the Bad River before the town was flooded in 1960. As a result of the flooding, the tribal leader began seeking federal support for relocation. The Bad River Housing Authority was established in 1963 to relocate the community, but the move to a new location a few miles east and further from the floodplain was not completed until 1993. The move recently gained new attention after massive floods inundated the old town. Although they now face less risk, some residents see their relocation as an extension of the serial displacement forced on many tribal communities. This feeling is compounded by the fact that the new town is largely composed of rental properties that are not owned by the residents.⁴

Although migration from flood zones is happening, in many cases it is simply the result of residents picking up and moving after another flood experience, rather than the formal climate migration programs that are necessary for systemic and equitable relocation and large-scale protection. Currently one in ten homes is vulnerable to significant flooding. The number will only increase over time, as sea levels rise and flooding events become more common.

⁴ The issue of climate migration is live and fraught for indigenous communities. Many residents of Odanah feel discomfort with their relocation being held up as a model. However, they were able to complete a move that many other communities have not been able to accomplish. In Alaska, the community of Newtok had been seeking money to relocate since 1994, but their efforts were stalled by the lack of funding to build new housing and infrastructure. As of June 2021, the move still is not complete.

Lessons

◆ **Community-led initiatives and homeownership are central to successful managed retreat strategies.**

- ▶ Our systems do a better job of serving communities where residents own their property. Where residents do not own their property or are not organized, it can be hard to move quickly in the wake of a climate disaster.
- ▶ Given the history of redevelopment and displacement, ensuring and communicating that properties will not be redeveloped or resold is important to garnering community support and buy-in.
- ▶ Other ways to increase support and buy-in include allowing communities to control how and where they move and responding quickly in the wake of a disaster.
- ▶ To prevent the perpetuation of inequities, specific attention must be paid to how communities of color, where residents tend to own less property and property is undervalued, are treated in developing climate migration strategies. The difference between voluntary migration and forced displacement is particularly important for Native communities.

◆ **Federal funding is key to managed retreat, but states can play an important role in determining effective strategies.**

- ▶ Engaging state and/or federal agencies and funds is important to countering local concerns over lost property tax income.
- ▶ If states can deploy resources to communities quickly, before home values depreciate, local governments may be more responsive.

◆ **Moving quickly facilitates effective and innovative responses.**

- ▶ Though preempting disasters is generally more cost effective, governments are often more open to moving money—and moving it quickly—in the immediate aftermath of a disaster.
- ▶ When capital is deployed quickly after a disaster, shifting political and community sentiments can open up opportunities for innovative responses, as well as for advancing solutions that have been slow to move. 🌱

Peoria Stormwater Management

Multi-Purpose Innovation

Like 800 cities and municipalities across the country, the City of Peoria has a combined stormwater system (CSO) that allows the overflow of raw sewage to enter waterways during heavy rains or snowmelts. In the 1980s and 1990s, the city spent \$10 million to cut down on the overflow, but in 2006, the U.S. Environmental Protection Agency found that the city's combined sewer overflow still violated the federal Clean Water Act when runoff during heavy rains and snows flowed into waterways. The City of Peoria and the EPA entered into negotiations at that time and finally reached a tentative consent decree agreement in December 2020.

The last six years of the 15-year negotiation focused on how the EPA would treat the expansion of green infrastructure pilots. In 2015, Peoria's Innovation Team (i-team), which was launched by a Bloomberg Philanthropies i-teams Grant, began working with community members to identify pilot projects that would meet the needs of the community and address stormwater issues. The first pilot was a pedestrian-friendly green street designed to absorb rainfall.

The second project is the nation's first stormwater farm, which has transformed a city-owned vacant lot into a community space and urban farm that captures stormwater. The 1.5-acre Well Farm at Voris Field was engineered and contoured to optimize stormwater management and is fully instrumented to measure that optimization. Vegetables and flowers are grown in raised beds and sold at the Peoria Farmer's Market. The planted trees are hybrid poplars, a fast-growing species that absorbs large quantities of water and can ultimately be harvested for timber. The project's mix of green features, underground storage, and urban agriculture prevents more than a million gallons of stormwater from entering Peoria's combined sewer each year. It has also created almost 30 new jobs.

Peoria's green infrastructure pilot projects were developed with federal and private funds by a community partnership that included local nonprofits, local contractors, community members, city leadership, and project manager Greenprint Partners. The projects have been widely touted as successes, and Well Farm won the 2019 U.S. Water Prize.

However, the projects also were at the center of ongoing negotiations around the consent decree. While Peoria tried to get the EPA to approve its green solutions to the city's sewage problem, the EPA wanted the city to install pipes, tanks, and gutters to divert the overflow. City Manager Patrick Urich estimated that installing more bioswales and rain gardens to absorb and redirect stormwater would cost around \$109 million over the course of the 18-year consent decree, about a quarter of the estimated half billion-dollar cost of traditional grey water infrastructure.

Influenced by the successful pilots, the approved consent decree gives Peoria the flexibility to use innovative measures, including investments in green infrastructure, to achieve its performance criteria with the stipulation that it meet four interim milestones to show continued progress. The city has stated that it will move towards 100% reduction of combined sewage overflow by 2034 and intends to demonstrate the effectiveness of green infrastructure in meeting environmental standards.



*Flooding in downtown Peoria, Illinois
Photo Credit: Jay Harrod, The Nature Conservancy*

What made this work?

Well Farm gave Peoria the proof of concept it needed to show the EPA that green infrastructure projects can provide innovative solutions to stormwater management while meeting long term sustainability needs. As municipalities pilot new technologies, they learn from each other and build off previous successes, forming an informal R+D chain for stormwater management. However, it took Peoria years to make its case, and if the city does not meet its milestones, it could become even harder for other green infrastructure projects to qualify to meet federal regulations.

What sets Peoria apart from other green infrastructure stormwater projects is that the pilots were driven by an explicit focus on social equity. Implementation began in areas of the city that have suffered from disinvestment. The i-team worked with community members and sought out projects that would address additional resident needs and interests, centering community benefits and engagement in identifying neighborhood-based infrastructure solutions. Well Farm, for instance, has a governance committee made up of local residents who work in partnership with the city, a local foundation, and a local non-profit.

The community outreach, city coordination, and fundraising for these pilots were supported by the Bloomberg i-team initiative, which provided the city with money and staffing. Some of the i-team's outreach strategies included working with the public health department to engage local residents and providing training on property redevelopment for small business owners. Along with the pilots, these types of small grassroots engagements built community support for ongoing experimentation and reduced resistance to the utility tax that will support larger investments.

What sets Peoria apart from other green infrastructure stormwater projects is that their pilots were driven by an explicit focus on social equity and they began by implementing pilots in areas of the city that had suffered from disinvestment.

Financing

The Well Farm pilot cost \$2 million (\$1 million of which came from the USDA Conservation Innovation Grant program) but is estimated to have generated \$2.8 million in economic activity so far. The estimated overall cost of the stormwater infrastructure is estimated at \$200-250 million. The first \$15 million tranche will likely be funded through a revolving loan program offered by the Illinois EPA and revenue generated from a new combined stormwater fee paid by city residents. After the 18-year period of the consent decree, the city estimates that annual maintenance fees will come out to about \$3.5 million per year. Starting in 2023, Peoria's newly created stormwater utility will increase sewage rates to help cover costs, which has already caused some pushback. However, the city council unanimously voted to approve the consent decree.

Other Communities

Across the country, numerous stormwater projects are experimenting with infrastructure upgrades that include climate resilience innovations. Some of these, such as Milwaukee's (see below), are managed by the local stormwater utility, but many involve new governmental partnerships, and some are financed through community-based public-private partnerships (CBP3s), such as the CBP3 in Prince George's County, Maryland.

One of the first cities to obtain federal consent decree approval for green water projects is Philadelphia, which began working with the EPA to develop green water infrastructure in 2011. The 25-year agreement between Philadelphia and the EPA seeks to reduce the city's combined sewer overflow by 85% and uses green water projects in conjunction with traditional stormwater systems. Within the first five years, Philadelphia exceeded its own targets and showed the efficacy of green infrastructure through projects developed on city-owned property. Philadelphia has adapted and scaled up many green water innovations that were developed elsewhere, such as the use of bioretention in Prince George's County.

The Milwaukee Metropolitan Sewerage District (MMSD), which manages wastewater from 28 municipalities, voluntarily began investing in green infrastructure in 2002. In 2007, MMSD incorporated green infrastructure into their CSO permit plan, which allowed them to regulate and fund green infrastructure projects within municipalities in their service area. In 2011, MMSD partnered with the City of Milwaukee to develop a plan that provides strategy and governs funding decisions for green infrastructure.

Like Philadelphia, Milwaukee relies on a combination of incentives and restrictions to support green stormwater development. Most of MMSD's funding comes from a tax levy, a portion of which is distributed to its municipalities. MMSD also provides rebates for certain projects and has very few regulatory requirements for projects. As a result, communities have invested in new approaches like green roofs, rain barrels, bioswales, and stormwater trees that can absorb water while also reducing carbon dioxide. These projects have captured 1.6 million gallons of water to date.

The United States is full of aging infrastructure that requires reinvestment. Stormwater projects are experimenting with green infrastructure innovations at multiple scales, from programs that encourage private residents to support stormwater retention to large projects on public lands. Whatever their scale, the complex dimensions and financing of these projects requires community buy-in. Because of their health and environmental impacts and regulations, stormwater infrastructure investments may precede other projects. Stormwater projects are experimenting with new climate resilience strategies at multiple scales, from programs that encourage private residents to support stormwater retention to large projects on public lands. Whatever their scale, the complex dimensions and financing of these projects requires community buy-in.



*Well Farm Groundbreaking Ceremony, Greenprint Partners
Photo Credit: Doug Leunig*

Lessons

- ◆ **Piloting projects that include community engagement and benefits can build political will to support innovation.**
 - ▶ Peoria began by working in communities that had the least infrastructure investment and building pilots around needs identified by residents. Besides providing an opportunity for the city to meet other community needs, this approach made the benefits of the projects visible.
 - ▶ Although Peoria continues to see some resistance to the increased utility costs associated with its new stormwater utility, community engagement made the effort more politically viable.
 - ▶ When projects include amenities that increase livability and reduce risk of runoff, they can lead to increased property values. While these increases can generate municipal revenue and capital gains for homeowners, they can also lead to additional pressures for communities at risk of displacement.

- ◆ **Large infrastructure investments offer an opportunity to test a variety of innovative investments.**
 - ▶ Philanthropy's financial support (in the form of grants or PRIs) can create space for climate innovation on large infrastructure investments.
 - ▶ Local jurisdictions can learn from and build off innovations tried elsewhere.
 - ▶ Federal agencies can coordinate to support these innovations; in Peoria one federal agency funded the pilots that were used to convince another agency of the suitability of green infrastructure.
 - ▶ Building out climate-resilient infrastructure at the appropriate scale for local climate hazards may require new entities, such as Peoria's stormwater utility, that have tax and fee collection power.

- ◆ **Maximizing the co-benefits of climate investments increases buy-in along with impact.**
 - ▶ Because climate strategies involve many systems, there are a variety of opportunities to address a wide range of social issues through climate investments.
 - ▶ Combining small projects with larger investments helps increase public participation and buy-in for long term, more expensive investments. 🌱

Blue Lake Rancheria Microgrid

Energy Infrastructure

When Blue Lake Rancheria, a 50-member tribal reservation in Northern California, built their solar microgrid, their goal was to provide climate-resilient infrastructure for the tribal community. The reservation, which includes Wiyot, Yurok, and Hupa people, sits on 100 acres of land in a rural area with high risk of earthquakes, flooding, and forest fires. In 2008, when the tribe began strategic climate action planning, they made reduced energy consumption a key component of their climate plan. A tsunami that hit the community in 2011 led to an additional focus on disaster preparedness. Since then, the Rancheria has hosted Federal Emergency Management Agency classes and trained over 1,000 local residents. Their efforts earned them the nickname Emergency Management Institute of the West, and in 2017 FEMA recognized their community preparedness efforts.

As the community began working on energy independence, they applied for a grant from the California Energy Commission to develop their own solar photovoltaic array microgrid. Tribe members saw the grid as a way of ensuring community independence, lowering emissions, and reducing the costs of supplying power. The Rancheria received a grant for the grid in 2015, and the project was fully commissioned by 2017.

It turned out that the benefits of the Rancheria microgrid extended beyond the reservation. In 2019, the tribe realized it was able to sustain essential services for the 136,000 residents in Humboldt County during power outages. In recent years, public service power shutoffs have become a more common practice in California as Pacific Gas and Electric (PG&E) and Southern California Edison, the state's two utility companies, shut off power on hot and windy days to avoid liability for fires started by their equipment. Often with little notice, these preventable outages leave communities without power, causing medical equipment failures, heat risks for the vulnerable, and disruptions to daily life. Humboldt County has the most energy cut-offs in the state.

Fortunately, the microgrid enabled the tribe to strategize on how to deploy its power. When PG&E imposed a utility shutoff in October 2019, the microgrid was able to provide power and general services to about 10,000 people per day. They kept the casino running, provided fuel for their fish hatchery and the municipal water system, offered local residents access to charging stations and internet, and housed critically ill patients in their hotel. In subsequent power outages, the microgrid built by this community of 50 has provided essential services to residents throughout the county.

In addition to community and climate benefits, the development of the microgrid project produced \$9.5 million in economic benefits, according to the California Energy Commission. Those benefits included decreased utility costs, increased utility stability, contracts with local businesses, and new jobs for both the development of the grid and ongoing maintenance.



*Aerial view of Blue Lake Rancheria, a federally recognized Native American tribe in northwestern California
Photo Credit: bluelakerancheria-nsn.gov*

Financing

The microgrid cost \$6.7 million, \$5 million of which came from a California Energy Commission grant through their Electric Program Investment Charge (EPIC) program. Most of the remaining funds came from revenue generated by the tribal casino. Since the development of the microgrid, the community has saved \$200,000 per year on utility costs.

Additionally, the community had seen how investments in sustainable infrastructure had direct economic benefits, a benefit that is clearer in smaller communities. In 2009, the tribe built their new casino with a focus on energy sustainability and had been experimenting with a biomass fuel system that sequesters carbon.

What made this work?

Microgrids are used by many large universities, business centers, and jails as a mechanism for ensuring their operations will not need to shut down during power outages. For any isolated community in a rural and disaster-prone area, energy independence is an important component of community security. The tribe's ongoing interest in climate resilience and independence and strong sense that larger institutions and systems of governance cannot be relied on undoubtedly played a role in their move toward a microgrid.

Additionally, the community had seen how investments in sustainable infrastructure have direct economic benefits, which are especially visible in smaller communities. In 2009, the tribe built their new casino with a focus on energy sustainability, and they had been experimenting with a biomass fuel system that sequesters carbon. The small size of the community and the immediate benefits of these investments deepened support for new innovations.

One of the challenges for the Rancheria was that investors were not sure how to predict the ongoing maintenance costs of the grid or the value of its energy savings because the technology is fairly recent. Community microgrids are expensive and rely on data management and battery technology that is rapidly changing. The platform used to run the microgrid at Blue Lake had never been used at a community scale before. However, as traditional power grids have become increasingly expensive and hazardous, there is a growing interest in microgrids, which is likely to result in data that will make the process more accessible.

Other Communities

Until the development of the microgrid at Blue Lake Rancheria, most microgrids were used by organizations that did not want to risk power interruptions and did not need private investment to pay for their systems. The Santa Rita Jail began building a grid in 2001 during the energy crisis. The grid has enabled the jail to continue to operate during recent public safety power shutoffs. Similarly, the Inland Empire Utilities Agency installed a microgrid to ensure smooth operation of their regional wastewater system. The system was installed with a power purchase agreement that required no capital investment.

Some private institutions, such as vineyards in Napa and a boarding school in Southern California, have also installed microgrids, but they were paid for without private loans as the institutions were able to use private reserves. And while institutions, agencies, and businesses are investing in microgrids to maintain mission-critical operations, new luxury developments are also using them. A 600-home development outside Burns, Oregon, features solar off-grid microgrids that are touted as ecological and cost-saving amenities. These early adopters illustrate the broader applicability and benefits of investing in microgrids.

The California Energy Commission, which administers about \$130 million per year, supports research and development of new energy investments through the EPIC program. The success of the Blue Lake Rancheria solar microgrid, particularly in a region known for rain and fog, has provided proof of concept that is making microgrid financing accessible to more communities. EPIC has helped other Native communities in California move towards energy independence and supported the development of other microgrid systems in the area, including at the Redwood Coast Humboldt Airport. The Hoopa Valley tribe is currently exploring a microgrid solution to the specific needs of their tribal community. Unlike Blue Lake, Hoopa Valley does not have its own utility infrastructure, which is why the community is looking into creating a network of distributed energy resources (DER) that will be spread out across several small buildings and centrally managed. Last year EPIC awarded a grant to the Native American-owned microgrid firm Indian Energy to install new technology for a microgrid in San Diego. These projects are learning from each other and expanding the capacity of what microgrids can do.



*The Blue Lake Rancheria microgrid integrates a solar array, battery storage, and control systems.
Photo Credit: Blue Lake Rancheria*

Lessons

- ◆ **Local control of investments and operating infrastructure builds capacity for co-benefits.**
 - ▶ While state subsidies helped make the Blue Lake microgrid possible, its design, ownership, and labor are all controlled at the local level. Local control of green investments allows for adaptations to address new climate risks while providing economic benefits.
 - ▶ Every community will have its own calculations about which high-cost investments are worthwhile. The specific energy needs and fire risks of Northern California mean that high-cost energy investments may be more attractive for communities that are not well served by (or pay a high cost to access) existing energy infrastructure. For each climate investment, the calculations and benefits will depend on local risks and context.

- ◆ **Energy investments generally require a supportive regulatory environment as well as buy-in from utility companies.**
 - ▶ Part of the success of the Blue Lake grid rests on its capacity to operate both connected to the PG&E grid and separate from it, which made PG&E an essential partner. Across the country, utility infrastructures are in need of upgrades. Pilot innovations can help utilities identify new models for energy investments.

- ◆ **Without outside investors for unproven climate innovations, communities need either public support or their own resources to fund new projects.**
 - ▶ Because the economic viability of a community grid was unknown, Blue Lake had to use its own resources and public grants to pay for their grid. For communities without resources, state funding becomes even more essential.
 - ▶ Public funding should support learning so that new innovations can be replicated. EPIC's grants focus on research, technology demonstrations, and market facilitation to accelerate proven solutions. 🌱

Portland Energy Efficiency Retrofits

Creative Funding

Most people recognize that rising housing costs create financial burdens for families, as reflected in the data on housing cost-burdened households. Energy cost burdens caused by rising utility costs in changing climates, which disproportionately impact communities of color, receive less attention. A recent study found that low-income communities of color “are 27% more energy cost burdened than low-income residents in white neighborhoods,” despite the fact that they use less energy.

Because many of these costs are associated with older, less weatherized housing stock, energy improvements such as insulation, window and door upgrades, and installation of energy efficient appliances can save residents as much as \$1,500 a year. Energy improvements have the added benefit of reducing energy consumption. Unfortunately, while investments in energy efficiency provide long-term cost benefits, the initial costs are unaffordable to many residents with low incomes.

Craft3 has found a way to make energy upgrades available to homeowners and renters without requiring an upfront investment. Craft3 is a regional community development financial institution (CDFI) that has provided funding to support community resilience in Oregon and Washington since 1994. In 2009, Craft3 began working with the City of Portland on an initiative called the Clean Energy Works Portland pilot, which aimed to make home energy loans that could be repaid through utility bills.

This model was made feasible by state legislation that allowed homeowners to finance energy projects through payments on their heating utility bills. The pilot targeted credit-constrained households by offering low interest loans for energy upgrades that could be repaid on utility bills. The program prohibits power shutoffs for delinquent payments, but the loss rate as of 2018 was less than 1%.

The Portland pilot worked with the main utilities and the local redevelopment agency as well as local community-based organizations, who provided outreach support to communities of color and assistance in applying for the program. When the pilot ended in 2011, a statewide program was developed in which homeowners can work with a list of approved contractors and Craft3 can provide a 50% deposit directly to the contractors. Another significant feature of the Craft3 repayment program is that delinquent loans are removed from the utility and serviced by Craft3. From 2009 to 2018, Craft3’s program provided \$50 million worth of loans for 4,000 energy upgrades in owner-occupied homes.

Financing

The Portland pilot was financed through the federal Energy Efficiency and Conservation Block Grant Program (funded by the 2009 American Recovery and Reinvestment Act) as well as public and private investment, which established a \$7 million revolving loan fund managed by Craft3. The utilities collected loan repayments on their customers' utility bills, which were then forwarded to Craft3. The statewide program created after the pilot ended was developed with a \$20 million grant from the US Department of Energy.

In 2013, the Self-Help Federal Credit Union purchased the home energy loan program's debt for \$15.7 million, which was the first secondary market transaction for on-bill repayment in the country. The sale to Self-Help gave Craft3 more capital to meet additional demand.

What made this work?

The innovations in Craft3's clean energy program relied on governmental support including regulations and subsidies. But as a regional CDFI with relationships with local community groups and an understanding of the risks and likelihood of repayment, Craft3 was well positioned to make their pilot successful. They established the terms and caps on energy retrofit with a strong understanding of the financial and energy needs of residents.

The program also benefited from the fact that the Pacific Northwest is a region with a large number of older single-family homes, where the market for a program focused on loans to low-income homeowners is strong. It should be noted, however, that most low-income families live in multi-family developments that they do not own.



Photo Credit: Ryan J. Lane

Other Communities

Climate technology start-up BlocPower uses a similar on-bill model to finance energy efficiency investments in multi-family developments. Since its start in 2014, BlocPower has retrofitted over 1,000 buildings in New York, saving residents 20-70% on their energy bills. Initiated with \$2 million of Department of Energy funding, BlocPower's model is based on their observation that investors are often uninterested in financing small projects in low-income neighborhoods, which they see as high risk. BlocPower's assessment was that the risk was lower than investors assumed, but it took them a while to realize that in order to scale up, they needed to build a marketplace to attract investors. In February 2021, BlocPower announced they had acquired \$63 million dollars in capital (\$55 million in debt and \$8 million in equity) to expand their efforts into 24 other cities. As with Craft3, customers use their utility bills to repay the retrofit costs.

The Property Assessed Clean Energy (PACE) program is also built on new financing tools for green energy. PACE allows owners to finance renewable energy and energy efficiency improvements on their properties through a special energy financing district. The financing attaches a debt to the property, which allows individuals to pass on the costs and benefits of solar installation with the property. PACE debt is authorized through local districts that establish special assessments for utilities. This requires state legislation and can be used for commercial and residential investments. Unfortunately, properties with PACE obligations are not eligible for Federal Housing Administration (FHA) funding.

As new technologies and climate risks emerge, there will be a continued need for new financial tools to bring climate adaptation within reach of residents. Creative financial models can help make this happen.



*Spray foam insulation that conserves energy
Photo Credit: PiLens Photo*

Lessons

◆ **State regulatory and legislative action can smooth the path for new investments.**

- ▶ The models for Craft3 and BlocPower use on-bill payment, which is allowed and/or subsidized in 30 states. PACE financing is allowed in 37 states.
- ▶ State and federal governments already incentivize some investments over others. Aligning incentives and regulations to make climate investments easier and more attractive should be a priority. Community-minded organizations should define how those investments are made, and subsidies should be provided to support pilot projects.
- ▶ Pilot projects can help advocates encourage supportive state and federal policies.

◆ **Local CDFIs and community development corporations (CDCs) may be uniquely positioned to pilot new climate-resilient financial models.**

- ▶ CDFIs are well suited to pilot climate investment models because they know their communities and their mission-based approach allows them to take risks that other financial institutions may be reluctant to take. This makes them good incubators for proving the financial viability of new loan products.
- ▶ Federal support can jump-start these innovations.
- ▶ Collaboration across the impact investment landscape can help scale successful innovation by offering take-out financing to successful investments and allowing capital to recycle.



Boulder County Wildfire Partners

Fire Risk Mitigation

While wildfires have always been a feature of the American West, climate change and sprawling development have increased the risks and exposures faced by many communities. Most of the large fires in the West occur in the wildland-urban interface (WUI), which refers to areas where development is adjacent to undeveloped natural areas. About 99 million people in the United States live in WUI areas, and 43% of all new homes are built in the WUI. Part of this development is the result of people desiring to live close to nature, but it is also a consequence of exclusionary housing and land use policies that mean affordable housing is increasingly found at the outskirts of sprawl. Unfortunately, this encroachment into undeveloped areas is increasing vulnerability to wildfires.

After the 2010 Fourmile Canyon fire destroyed more than 150 homes in the foothills of Boulder, Colorado, the county decided they needed to be more proactive about wildfire mitigation. In 2014, they started Wildfire Partners, a public-private partnership led by the county. While the program is staffed by fire protection experts, insurance companies were also involved in the program design.

The program includes a home and property assessment, personalized fire mitigation recommendations, lists of qualified home retrofit and forestry contractors, and subsidies for forestry work (supported by grants from the Colorado State Forestry Service and FEMA). Program participants who complete the recommended changes receive a certificate that is accepted by home insurance agencies Allstate, State Farm, and USAA, creating an incentive for participation.

When the 2016 Cold Springs fire hit the region, 281 homes had been certified and all the certified homes within the burn zone survived the fire. By 2019, almost 2,500 homeowners were participating in the program, and over 1,000 had been certified.

Financing

Wildfire Partners started with grants from FEMA and the Colorado State Forest Service totaling \$3.8 million. It is currently funded by a FEMA grant and the county. Homeowners are charged a participation fee that also helps cover some costs, although fees can be waived.

The Wildfire Partners certification program is often the only pathway for residents in high-risk areas to obtain fire insurance, which increases interest in participation. As certified homes withstand fires, confidence in the program grows.

What made this work?

Boulder County has required residents to do wildfire mitigation for decades, but before this program was put in place, it was unclear what type of mitigation was needed and how effective mitigation could be. In 2013, Governor Hickenlooper convened a statewide task force on wildfire insurance. The group recommended requiring wildfire risk ratings and disclosures as well as creating a statewide mitigation program and charging a fee to homeowners in high-risk areas. At the time there was intense political backlash from real estate groups and homeowners, who were concerned that low ratings would decrease property values and argued that insurance policies were already rating risk.

In the past eight years, insurance companies have started to recognize that current policies are unsustainable. Because of the local fire risk and its partnership with insurance companies, the Wildfire Partners certification program is often the only pathway for residents in high-risk areas to obtain fire insurance, which increases interest in participation. As certified homes withstand fires, confidence in the program grows. Programs like Wildfire Partners show how compliance can be implemented and fire risks can be reduced, which may pave the way for greater regulation of wildfire mitigation.



Smoke rises into the sky just hours after the Left Hand Canyon fire broke out in Boulder, Colorado
Photo Credit: Joseph Gruber

Other Communities

In many communities, market conditions continue to incentivize development in areas with a high fire risk as individuals seek affordable housing and local governments collect tax revenue from these developments. The ongoing crisis around housing affordability has made progress around wildfire mitigation a challenge with complex equity implications, given the many people with low incomes and communities of color who are pushed into housing at high risk of wildfire exposure.

In Sonoma County, the connection between affordable housing and wildfire vulnerability was made clear when the 2017 Tubbs Fire destroyed more than 5,000 homes, including a 162-unit mobile park in Santa Rosa. While the majority of homes destroyed in the fire were owner occupied, many more renters were uninsured than homeowners, and they had little support for recovery. Meanwhile, the desire of local residents to stay in the area and the ongoing regional housing crisis led to a 36% increase in rents. In response to the post-fire housing needs, the City of Santa Rosa and Sonoma County created a joint powers authority, the Renewal Enterprise District (RED), to coordinate producing affordable housing units that increase density and incorporate wildfire mitigation. The RED provides gap financing for housing development that meets key criteria, which include equity and climate considerations. Sonoma County also consulted with Wildfire Partners after the Tubbs Fire to learn about their program.

While wildfire mitigation and planning are essential, there is still an urgent need to rethink development in high fire risk areas, especially after fires like the 2018 blaze that destroyed 95% of homes and killed at least 86 people in Paradise, California. Paradise is emblematic of the growth of WUI development, where new homes continue to be built at an alarming rate. Despite its deadly risks, between 1990 and 2015, 32 million new homes were built in WUI areas nationwide. Unfortunately, many state regulations do not encourage insurance companies to implement sound policies around fire risk. In 2019, after multiple years of paying out more in claims than they generated in premiums, California insurance companies dropped coverage for more than 200,000 policies. In response, the state passed legislation issuing a one-year moratorium on non-renewal of coverage in areas affected by wildfires, choosing the political expedience of keeping homeowners happy over admitting that certain regions may be too risky to develop. In February 2021, California created a partnership to establish state standards for wildfire protection that may begin a move towards longer-term wildfire planning in the hopes of influencing insurance policies. Currently only 13% of California insurance policies incentivize wildfire mitigation.



*View of the October 2020 Cameron Peak fire from Estes Park, an hour from Boulder.
Photo Credit: Art Messal via Estes Park Trail-Gazette*

Lessons

◆ **Programs crafted to address local climate risks can illustrate the feasibility of better climate management.**

- ▶ Political will for climate mitigation strategies will change as climate risks increase and can be influenced by the implementation of effective programs.

◆ **Insurance companies are important stakeholders in the design and implementation of programs for rethinking disaster risk.**

- ▶ As the costs of claims increase, insurance companies have an existential interest in identifying and developing good tools for assessing and ensuring risk management.
- ▶ It is important to protect under-insured residents of low-income communities that may be at higher risk of losing insurance and to devise and/or subsidize new programs that meet their needs.

◆ **Perverse financial incentives must be remedied.**

- ▶ Current policies like lower land values in the WUI and lack of attention to rebuilding costs obscure the dangers of developing housing in areas of high fire risk. Long-term planning and political will are needed to rethink where housing is built.
- ▶ Government and industry have resisted strong information requirements that could help home buyers understand and price fire risk. Currently only two states require wildfire risk disclosures.
- ▶ Affordable housing is most available in places that are vulnerable to climate risks, which means that policies attempting to limit development in areas with high climate vulnerability can have a greater impact on households with limited incomes, especially in areas where affordable housing needs are greatest. Therefore attempts to limit high climate risk development should also resource low climate risk affordable housing. 🌱

Watts Rising

Community Planning

Coordinated Partnerships and Planning for Climate Resilience

Since 1965, the South Los Angeles neighborhood of Watts has been synonymous in many people's minds with the uprising in response to police brutality that led to the deployment of 14,000 National Guard troops and resulted in 34 deaths and an estimated \$40 million dollars in property damage. In subsequent decades, the demographics of Watts have changed from predominantly African American to predominantly Latinx, but Watts remains a community characterized by historic disinvestment, environmental injustice, and community activism. Today, some of this activism is focused on climate-resilient development.

Watts is home to 40,000 residents, many of whom are exposed to high levels of air and noise pollution in addition to being isolated from many urban amenities. In 2017, the Housing Authority of the City of Los Angeles began to convene residents in what became *Watts Rising*, a community-driven initiative to transform the area through projects designed to reduce greenhouse gases while providing local environmental, health, and economic co-benefits. The *Watts Rising* investments include 24 projects across seven issue areas: affordable housing and sustainable communities, food waste prevention and rescue, low carbon transportation, rooftop solar and energy efficiency, transit operations, urban and community forestry, and urban greening.

As a group of investment projects and programs centered on climate resilience, *Watts Rising* was able to apply for and was awarded a grant from California's Strategic Growth Council as part of the Transformative Climate Communities (TCC) program. TCC funding requires applicants to develop plans for community engagement, workforce development, and displacement avoidance, but in many ways the *Watts Rising* investments are simply good developments that include climate adaptation and mitigation strategies. For example, its central public housing development, *Jordan Downs*, was designed with LEEDS Gold certification and has funding for discounted transit passes, a job training program for residents, new pedestrian pathways, and the planting of 300 trees.

What makes the *Watts Rising* projects unique is that these types of investments are generally not made in low-income communities of color and are generally not coordinated. This reflects the mandate of TCC, which was authorized in 2016 to fund the development of neighborhood-level transformative climate plans for disadvantaged communities. TCC is funded by revenue generated from California's cap-and-trade program. As a result of environmental justice advocacy, state law requires that 20% of cap-and-trade revenue be allocated to projects that reduce greenhouse gases in disadvantaged communities.

Financing

In 2019, the Strategic Growth Council awarded \$33.25 million to the Watts Rising Collaborative. The collaborative is leveraging an additional \$168 million in finance and subsidies to support their vision, including a \$35 million Choice Neighborhoods Implementation grant. The additional funds come from a variety of sources. For example, the Jordan Downs public housing redevelopment project was financed through low-income housing tax credits (LIHTCs), a tax-exempt bond, loans from The California Endowment, Freddie Mac, and soft loans from the Housing Authority.

Using planning for an existing development allowed them to build out a more comprehensive plan that went beyond housing and to support the development of Watts Rising.

What made this work?

The Watts Rising collaborative incorporates the work and vision of 19 partners in Watts, many of whom have been working in the community for decades. Many of the local community organizing efforts have focused on specific issues such as transportation and food access, affordable housing, and jobs. All of these issues have climate implications, but it took funding to create the organizing entity that brought these groups together.

Many of the outreach and engagement strategies deployed by the community advisory committee preceded the creation of Watts Rising. For example, in 2013, Charles Drew University organized a survey of 700 Watts households administered by local youth. The survey findings informed the Watts Rising project design and laid the groundwork for ongoing surveys of residents as the project progresses. The TCC funding was also the result of ongoing advocacy from local environmental justice organizations and in turn led to a focus on community process.

The Housing Authority of Los Angeles was already planning a redevelopment of Jordan Downs when they learned about the TCC grant opportunity. As part of their planning, they had put mechanisms in place for community outreach and engagement and were able to tap into the rich organizing history of the neighborhood. Using this planning for an existing development allowed them to build out a more comprehensive plan that went beyond housing and to support the development of Watts Rising, which brought in other community interests and voices. Although the long-term impacts of this collaborative effort remain to be seen, initial evaluations are promising.



Rendering of Jordan Downs by SVA Architects, courtesy of BRIDGE Housing

Other Communities

There are many ways to integrate climate resilience into projects. But climate resilience investments are more likely to be sustainable when they coordinate across a variety of projects and programs within the footprint of shared climate risks. The projects below reflect other forms of coordination and collaboration around revenue for climate investments.

Unlike Watts Rising, which used state funding to bring together projects supporting climate resilience, the Great Rivers Greenway District (GRG) in Missouri is a special district that was initially promoted as a way to improve quality of life but has used its regional footprint to mitigate flood risks. In 2000, the residents of the City of St. Louis and St. Louis and St. Charles Counties voted on a proposition to create a sales tax that would invest in connecting the region's rivers, parks, and trails. This Clean Water, Safe Parks and Community Trails Initiative provided GRG with a \$10 million budget through a one-tenth of one cent sales tax. Including strategies for mitigating flood risks in a region where flooding has long been a clear and present danger made this effort a climate-resilient investment.

By creating a revenue stream that covered the major flood risks for the area, GRG has become an important layer of regional governance and is able to access other funds for projects that support its broader vision while addressing long-term climate resilience. GRG has jurisdiction over three counties and 120 municipalities and is governed by a 12-member board that works with 265+ partners. The sales tax initiative that supported the formation of GRG was led by a broad base of grassroots organizations who used the proposition to engage voters in the vision of a regional plan.

A different type of multi-sector collaboration and governance is at play at a smaller scale in Washington's Duwamish Valley. As a Superfund site and the home to Seattle's only river, the Duwamish Valley faces multiple environmental risks; sea level rise, historic neglect, and aging infrastructure make it particularly vulnerable to climate change. Like Watts Rising, the collaborative in the Duwamish Valley emerged from an investment opportunity (in this case \$100 million for stormwater management from the Seattle Public Utility [SPU]), which the City of Seattle used as an opportunity to build a larger collaboration centered on community needs.

SPU's infrastructure investment led to a partnership of city departments (anchored by the Office of Sustainability and Environment and the Office of Planning and Community Development) that seeks to incorporate environmental justice and equitable development into their climate mitigation and adaptation investments. The Duwamish Valley Action Plan, which was released in 2018, lays out the goals and strategies of this city-community vision.

The scale and scope of climate investments in Watts, St. Louis, and the Duwamish Valley are different, but in each case the communities developed a multi-sector collaboration that is seeking to advance multiple investments that integrate climate change and equity.

Lessons

◆ **Community organizing can lay the groundwork to take advantage of emerging opportunities.**

- ▶ The Community Advisory Committee of Watts Rising is composed of many local leaders with long histories of community advocacy along with representatives of various agencies who are integral to the success of this work. Many of the priorities in the plan had previously been clearly identified as community needs.
- ▶ As new climate strategies such as cap and trade bring revenue to state government, organizing and advocacy can ensure that money is allocated to communities of color.

◆ **New governance structures and funding can encourage multijurisdictional and cross-sectoral collaboration.**

- ▶ Grant funding can help developers add climate and equity to existing projects.
- ▶ Large investments such as stormwater or sea rise infrastructure offer an opportunity to embed a variety of innovative investments.

◆ **Climate resilient investments do not need to reinvent the wheel.**

- ▶ Climate resilience can be layered onto investments that are not explicitly climate oriented. There are many ways to use existing mandates, investments, and projects to achieve climate and equity benefits.
- ▶ Localities can learn from each other about the possibilities for climate investments and their co-benefits. 🌱

Conclusion

As its impacts multiply in scope, severity, and frequency, climate change threatens to further destabilize low-income communities and communities of color. If “housing policy is climate policy,” then equitable development must be climate resilient. The scope and scale of climate risks requires linking local communities and institutions with regional and federal agencies to achieve equitable climate resilience. Although climate effects are local, most of the information, funding, and finance for climate investments cannot be sustained at the local level. Comprehensive strategies for climate resilience therefore require coordination between local communities and amongst local, regional, state, and federal governments, as well as government funding at all levels and private grants and investments to support and scale innovation.

Making climate resilience a universal good will be expensive and will require coordination across all these institutions and stakeholders, but it can be done. The case studies above illustrate a variety of strategies for scaling up investments in climate resilience. These overlapping strategies are outlined in more detail below, but the key take-aways are:

1. Climate equity must start with local communities. Local needs and conditions differ; local buy-in is essential. Realizing the potential co-benefits of climate investments depends on mobilizing the community.
2. Climate must become a consideration in all investments and policies, from zoning and land use to housing, energy, transportation, and water decisions.
3. The cross-cutting nature of the climate challenge requires coordination across agencies, levels of government, and sectors. In some cases, this means experimenting with new types of authorities.
4. To spur innovation, we need public and philanthropic dollars to absorb risk and prove new methods.
5. Mission-oriented financiers such as CDFIs and impact investors can play a critical role in testing and financing climate interventions.

Equitable climate resilience requires community buy-in and/or ownership. Many of these case studies show how communities embraced new ideas, projects, and technologies because they provided visible co-benefits at the local scale, the community was empowered in the decision-making process, and/or the community (or community members) owned the result. Given the scale of investments needed and their equity implications, successful climate work requires strong community engagement. Mitigation in the wake of climate disasters provides an opportunity for community engagement that should carry into longer-term work around adaptation and development.

Community advocacy lays the groundwork for equitable climate resilience. Thirty years ago, cap-and-trade funding was just a concept. Today it finances many of California’s climate innovations. Since the program’s launch in 2013, cap-and-trade has generated \$12.5 billion in revenue. In 2016, long-term organizing by environmental justice advocates resulted in the state passing legislation requiring a quarter of that revenue to be spent in disadvantaged communities. This legislation has funded programs like Transforming Climate Communities, which supported the investments in Watts described above. A variety of revenue streams that can play a central role in assuring equitable climate resilience will likely emerge in the next few years. Ideally money from these new sources of revenue will be designed with equity goals in mind, but advocacy can also help redirect resources.

Climate should be included in all policies and program implementation. Achieving climate resilience requires that we incorporate climate considerations into all development and investment decisions. Much of the success we have seen, particularly with regard to fuel efficiency and solar power, reflects the importance of federal coordination in creating incentives. In the context of community development, many federal agencies (HUD, FEMA, DOT, EPA) have a stake in innovations and funding pilots that support climate resilience, but the inclusion of these considerations is uneven. FEMA is an example of an agency where many guidelines create perverse incentives by funding rebuilding that refuses to allow for climate adaptations.⁵ Insurance is another area where current policies do not support climate resilience, but the Boulder County case study shows that aligning local policies through a program that is coordinated with insurers has reduced risk.

Agency coordination and alignment is essential to advancing innovation. New climate-resilient innovations require federal and state mandates and grants to get them off the ground, but the government can also play a key role in ensuring that costs and savings generated by climate investments are invested back into climate resilience efforts in the communities that most need them. Unfortunately, many agencies continue to work at cross purposes or have internal inconsistencies, as highlighted in the Peoria case study. The lack of cross-agency coordination impedes progress and makes it hard for local advocates to replicate successful innovations (as referenced above). Local governments are key to ensuring the equitable distribution of impacts through implementation. Most local jurisdictions struggle with how to fund programs and services to meet the existing needs of their communities, and property taxes are the leading source of revenue for local and state governments. In this context, it is politically challenging to expect local governments to experiment on their own with untested and expensive innovations that may reduce a central source of revenue (e.g., climate migration).

Solutions must be coordinated and financed at the scale of the climate impact. Because many climate risks operate at a regional scale, they cannot be adequately addressed at the local level. As we have seen with the cap-and-trade efforts in California over the past 15 years, state or federal funding can support regional investments or shift local calculations. Both St. Louis and Peoria have created revenue generation systems that match the scale of the problems they are trying to address. Other governments have used resilience bonds to support mitigating climate risk at the appropriate scale, including Central Arkansas Water's green bond and the public-private partnership that formed to support Blue Forest's Forest Resilience Bond

Public investment is needed to spur the private market. The history of solar power illustrates the positive role government can play in spurring innovation. Although the federal government provided billions of dollars in loans to support the solar industry, there were no facilities larger than 100 megawatts within the United States. At the time, the technology was untested and commercial lenders were unwilling to invest. As the success of federally funded projects grew, the private sector became willing to enter the market. This type of iteration is also what has allowed on-bill financing of housing retrofits to expand. There are new technologies on the horizon that will require similar public support. For instance, in Oregon, a pilot project to harness the energy of ocean waves is being run by Oregon State University with support from the Department of Energy.

⁵ Although many plastic storm drains melted after the Tubbs Fire, causing increased toxic drain-off, and there is significant research indicating a need for more fire-resistant materials, FEMA only funds rebuilding with plastic pipes, promoting the very construction that is vulnerable to climate risks.

Philanthropy is a critical partner for the short and long term. Philanthropic giving and capital investment are both needed to encourage innovations and sustain ongoing investments in climate resilience. Philanthropy can play an essential role in supporting civic collaborations and adding capacity to local governments so that they can add climate and equity lenses to their work. In many cases, climate risks are too large and expensive for one municipality to take on, so many innovations involve some form of regional collaboration. This may entail a new regional governance structure or working with institutions, such as utilities or stormwater districts, that operate at the regional level. Philanthropy has funded the planning for many of these structures and can continue to play an important role in this space.

Strategic government interventions can lead to successful market modification. The market will respond if government aligns its incentives and regulations to support climate resilience. This market response can be enhanced by regulatory and lending requirements that incorporate equity and climate resilience. Even simple legislation, such as the wildfire disclosures sought in Colorado, can have a fast and measurable impact on how homes are valued, which can drive development decisions. But these market responses must be carefully crafted to prevent negative equity consequences.

Mission-oriented lending institutions such as CDFIs have an essential role to play in incubating new markets. Regulations built on data collected from public and private innovations can be used to spur greater innovation and accelerate investment. Local community investment institutions are well suited to testing new financial models and incentivizing investments in areas that can withstand climate risks. Many local CDFIs have already voluntarily begun to include climate risks in their lending decisions. These decisions should be comprehensive and look at the whole region as opposed to individual developments. Some recommendations for regulatory support of climate resilience were published this spring by Self-Help, one of the largest CDFIs in the country.

Act now. While there is an urgent need for more systemic investments for climate resilience, there is plenty of work to do right now. All climate work will take time and over time our capacity to do it will grow, but we do not need more information to begin. Leaders should be seeking and seizing any opportunity to incorporate climate resilience into the work they are already doing. Not all of these efforts will have the intended results, and future developments may add new complexity to what is needed, but we can learn from what works. Doing nothing is doomed to fail.

Climate change is here. So far, investments to reduce its causes and protect communities from its negative effects have been unevenly and inequitably distributed. As climate investments grow, there is a risk that the same communities that have long been excluded from investments that promote health, safety, and economic security and that face the greatest climate risks will also be excluded from climate benefits. Ensuring that does not happen will be expensive. It will require meaningful community engagement and a great deal of coordination between multiple institutions and stakeholders. But, as we have shown here, there are a variety of processes, strategies, and steps that can be taken to move towards the climate-resilient future we need. The movement is already underway; it just needs more of us to join it. 🌱

About the Author

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