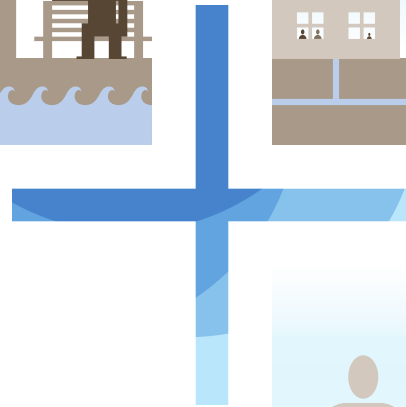
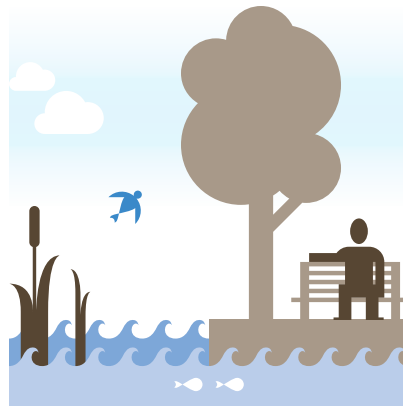


AN EQUITABLE WATER FUTURE

Camden





ABOUT THE WATER EQUITY TASKFORCE

Water shapes economic growth, the environment, and the social fabric of our communities. Ensuring that all people have access to safe, reliable, and affordable water and wastewater systems is the cornerstone of a sustainable and prosperous nation. We **all** have a role to play in forging progress.

The Water Equity Taskforce is a network of cities that work together to develop more equitable water policies and practices. Convened by the US Water Alliance—and comprised of cross-sector learning teams in the cities of Atlanta, Buffalo, Camden, Cleveland, Louisville, Milwaukee, and Pittsburgh—this initiative is advancing understanding of the challenges, opportunities, and promising interventions to promote equitable water management.

This roadmap was developed by the Camden Water Equity Team to build shared understanding of the challenges, opportunities, and priorities for action to secure an equitable water future for all Camden residents. It is a call to action to align the resources and capacities of the public, private, and nonprofit sectors to advance equity and inclusion in Camden through smart water management.

Camden Water Equity Taskforce



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INTRODUCTION

The city of Camden is defined by its relationship to water. Camden sits within the upper estuary region of the Delaware River Watershed, which supplies water for 15 million people. It is surrounded by water on three sides, forming a peninsula across from the city of Philadelphia. The Delaware River waterfront is a central part of the city's history and identity. Local leaders understand that water is essential to the city's environmental, social, and cultural fabric, as well as public health.

Camden also faces a range of challenges, from combined sewer overflows to climate impacts to aging systems in need of investment. Water stress in Camden is one of many cumulative impacts affecting vulnerable communities; as an older industrial city that has weathered economic shifts, many residents face serious economic and environmental challenges. Camden's population is primarily made up of communities of color, lower-income people, and other vulnerable groups.

To secure a sustainable and prosperous future, stakeholders in Camden must build upon their shared values and deepen their focus on fostering equity and inclusion in water management. Smart water policies and practices can help improve outcomes for the most vulnerable, allowing the city and its people to reach their full potential. Recognizing this, a team of local leaders have partnered with the US Water Alliance to develop collaborative approaches to make Camden's water management systems more equitable.

This report is organized in the following manner:

- **Background and Demographics** describes Camden's historical and socioeconomic context;
- **Water Equity Challenges** takes a closer look at water issues facing vulnerable communities in the city; and
- **Priorities for Action** highlights promising areas of work and describes strategies to advance water equity in Camden.

BACKGROUND AND DEMOGRAPHICS

Understanding Camden's history and demographic landscape is crucial to advancing equitable water management, because water challenges are deeply connected to spatial, economic, environmental, and social conditions. The city has many assets it can draw on to address these challenges and create a more equitable water future, including a strong ecosystem of local organizations working towards socioeconomic equity and environmental quality.

Shifting Economic Base

Camden is feeling the effects of the decline of the manufacturing and shipbuilding industries. Manufacturing jobs fell steadily over the last 30 years: by 1990 only half the manufacturing firms that existed in 1970 were still operating, and by 2000 only 5,000 of these jobs were left.¹ As jobs declined, migration to the suburbs increased and Camden's population decreased. The city government has a structural deficit and has struggled financially for years² with a shrinking tax base that has made it difficult to invest in infrastructure and services.³ Healthcare, social assistance, retail, transportation, and tech service⁴ employment has filled in the gaps, but not to the levels of employment nor wages offered by manufacturing.

Reversing the historic conditions that led to economic decline will be a long-term task, but Camden is heading in the right direction. Unemployment is lower than it has been in decades, and local businesses are benefitting.⁵ The city is receiving more investment, partly due to New Jersey's Economic Opportunity Act of 2013, which encouraged businesses to move to distressed cities. As a result, Subaru and American Water relocated their headquarters to Camden and the Liberty Property Trust made a one billion-dollar investment in the city.⁶ Camden received \$2.5 billion in investments since 2012, spurring a \$4.2 billion boost to the economy.⁷ The city has also received significant environmental investments, including about \$250 million in New Jersey Water Bank and Infrastructure Bank investments and over \$75 million in land improvements, largely funded by the New Jersey Department of Environmental Protection's Hazardous

Discharge Site Remediation Fund and Natural Resource Damages settlement monies. These investments support a more stable and prosperous local economy.

Population

Camden lost approximately one-third of its population between 1950 and 1980, and then continued to decline less dramatically.⁸ As of 2016, the total population of Camden was 76,005, as compared to its peak of 124,000 in 1950.⁹ The resulting decline in the tax base has made it difficult for the city to invest in important systems and services, including water infrastructure.

Race and Ethnicity

Camden experienced a demographic shift as Latinx and African-American populations increased while overall population declined.¹⁰ Race is strongly correlated with health disparities, exposure to pollution, and vulnerability to natural hazards;¹¹ lower-income people, immigrants, and communities of color in Camden often live in neighborhoods of concentrated poverty, high crime, and environmental risk. Camden has a large share of African-American residents (47.6 percent) and a smaller share of white residents (15.3 percent); and almost half of Camden residents (49.1 percent) identify as Hispanic/Latino.¹²

Age

Young children are an especially vulnerable segment of the population and may need specific health and social services. Water quality risks like lead in water can be more dangerous for children. Children under five years old make up 8.9 percent of Camden's population, as compared to 5.9 percent for the state of New Jersey overall.¹³

Income

In 2016 the median household income in Camden was \$26,214—significantly less than the national median income of \$55,322. The disparity is even more stark when compared to median household income for the state of New Jersey, which was \$73,702.¹⁴ There is also a significant earning disparity between white people and people of color in Camden: in 2014, median hourly wages for whites were \$26, while people of color earned \$19 per hour.¹⁵

Employment

In Camden, unemployment was at 16.5 percent in 2016.¹⁶ In terms of labor force participation, 41 percent of the population between 16 and 64 years old did not work in 2015, which is dramatically higher than the national measure where 25.1 percent did not work. This segment increased by 4.2 percent between 2000 and 2015. Employment status is unevenly distributed across the region because many jobs have left the city for the suburbs.

Poverty

Income is one of the strongest predictors for compromised health and capacity to recover from disruptions like extreme weather and environmental stresses. In total, 40 percent of Camden's population live below the poverty line, and 20 percent live in a condition of deep poverty, which is defined as earning an income of less than half of the federal poverty level. The national rate of deep poverty is 6.8 percent.¹⁷ In 2015, close to half of people of color were living below the poverty line in Camden. Poverty is highly racialized in Camden—31 percent of Latinx residents lived below the poverty line in 2015, as opposed to only eight percent of white residents.

Language Proficiency

People with limited English proficiency need materials in their primary languages to access healthcare, social services, and emergency services. In Camden, close to 13 percent of the population does not speak English very well, while the national measure is 8.6 percent.¹⁸

Educational Attainment

Educational attainment is an indicator of access to stable, well-paid employment. In Camden, 32.4 percent of the population under 25 years old have less than a high school education. By 2020, 45 percent of jobs in the Philadelphia-Camden metro area will require an undergraduate degree or higher, but according to recent studies the education system is not adequately preparing people of color for these jobs.¹⁹

Housing

Families with housing costs exceeding 30 percent of their income are considered housing cost-burdened under federal standards. In Camden, 46.6 percent of property owners have mortgage payments higher than 30 percent of their household income, and 57.6 percent of renters pay more than 30 percent of their income towards housing.²⁰ Camden's housing stock tends to be older and may expose residents to health hazards like lead paint and plumbing.

Camden is in a racially segregated region—the city's population is comprised primarily of people of color, but it is surrounded by higher-income white suburbs. Residential segregation is a major driver of racial and economic inequality as it affects access to employment, food, and recreation; educational attainment; exposure to crime; pollution; and quality of life in general.²¹

WATER EQUITY CHALLENGES

Camden's history and demographics affect the way that residents experience water stress, because many communities already face economic, environmental, and health challenges. At the same time, there are a number of promising initiatives that are developing solutions to these challenges. This section describes the equity impacts of water challenges in Camden, and the next section highlights initiatives that are successfully addressing them.

Aging infrastructure

Aging infrastructure underlies many of the water challenges in Camden: the city's water, wastewater, and stormwater systems are over 70 years old, with some parts built over a century ago. These systems need maintenance and upgrades due to their age and the presence of a combined sewer system—which requires additional upkeep even in newer systems. Water services in Camden have had significant issues over the years related to aging infrastructure, such as discolored tap water and lead in some school drinking fountains. As a result, public trust in water systems is low.

Water quality

The city faces several water quality challenges:

Industrial pollution

Water quality in Camden has historically been threatened by industrialization; as a result, the city has over 200 contaminated sites and several Superfund sites. Industrial runoff affects water for drinking, fishing, and recreation.²² Past pollution and current discharges to waterways affect surface water and groundwater quality and threaten future water supplies.

Groundwater vulnerability

The region sits atop the Potomac-Raritan-Magothy (PRM) Aquifer, the primary source of water for domestic, industrial, and agricultural uses in southern and central New Jersey. The aquifer has been contaminated by industrial pollution,²³ and overuse has resulted in significant drawdowns in water supply wells, reduced surface

water base flows, and increased saltwater intrusion in the Camden region. Water flow and quality modeling indicates that saltwater intrusion will increase in the Camden region if overuse of the aquifer continues.²⁴ Projected sea level rise will exacerbate the threat to water quality.²⁵ In response, the New Jersey Department of Environmental Protection (NJDEP) regulates and restricts water usage in this critical aquifer area to protect future water supply.²⁶

Combined sewer overflows

Flooding is dramatic and frequent in Camden: close to 70 combined sewer overflow (CSO) events take place in the Camden wastewater system in an average year. CSOs are not only a problem for water quality, but for public health and property damage as well.²⁷ Camden's combined sewer system (CSS) collects domestic sewage, industrial wastewater, and urban runoff in a single-pipe sewer. Under most conditions, the CSS transports wastewater and stormwater to the Camden County Municipal Utilities Authority (CCMUA) sewage treatment plant, and ultimately discharges to the Delaware River. During periods of heavy precipitation the combined wastewater and stormwater flow can exceed the capacity of the CSS and the treatment plant, and the excess is diverted to nearby water bodies. Combined sewage is allowed to overflow to one of the city's 28 CSO regulators, which discharge to either the Delaware or Cooper Rivers. Many older US cities like Camden are engaged in a debate regarding the best techniques to manage CSO events.

The monthly average rainfall in Camden is two to four inches,²⁸ but just one inch of rain can flood the city's streets, parks, businesses, and homes with a mix of stormwater and untreated wastewater. With more than half of the city's area covered by impermeable surfaces, one inch of rain will result in 83 million gallons of runoff, well above the capacities of the combined sewer system and sewer treatment plant. Storm intensity, duration, and frequency are additional contributing factors, as well as tidal influences on the receiving waters.

Lead service lines

Lead service lines are not part of the city water system, but due to Camden's older housing stock, lead is still present in plumbing fixtures and lateral service lines of an unknown number of houses and schools. While corrosion control measures are in place and water quality standards are met in treatment plants, in system pipes, and at test site taps, there is no guarantee of the same quality in every home's tap. To reduce risk, residents can let water run for approximately one minute before each use to clear the line. Many public schools use bottled water.

Non-revenue water

Between 2004 and 2008 Camden's system had a non-revenue water rate of close to 45 percent. This means that water was either un-billed or unused due to a combination of leakage, storage overflows, and metering and billing errors.²⁹ Non-revenue water is a significant financial loss for utilities. This can increase pressure on a public service already struggling to invest in aging infrastructure and fund upgrades. In 2016, American Water took over operation and maintenance of the city's water systems and pledged to bring non-revenue water from its total of 53 percent in 2016 to 15 percent, a more common rate of water loss in the industry. In the first two years, non-revenue water has been reduced to 42 percent.

Water affordability

In the US, the costs of drinking water and wastewater services have increased steadily over the last 40 years, faster than inflation and incomes due to the need for new investment and maintenance of aging infrastructure. In Camden, current sewer rates are close to the affordability threshold recommended by the Environmental Protection Agency (EPA). Residents receive discounted rates because state law allows wastewater authorities to offer a benefit to the communities living near their treatment plants. Consistent with this law, the CCMUA recently entered into a special arrangement with Camden to provide a sewer bill discount to residents. CCMUA charges Camden residents \$220 per household per year for sewer services, while the rest of the county pays \$352 for the same services.³⁰ The discount benefits all homeowners, many of them low-income. This approximates rate relief based on income, although it does not apply to renters.

New Jersey American Water also has a customer assistance program for people who need assistance paying their water bills. The Help to Others (H2O) program serves households who are at or below 300 percent of the federal poverty level. Recipients may get up to \$500 in grants and up to a 100 percent discount on their monthly service charges. There are other programs available to those who receive Social Security or Medicare benefits.

Climate change impacts

Camden sits in one of the more vulnerable parts of the country in terms of climate change. As a city bordered and bisected by tidal water bodies, sea level rise and changing precipitation patterns will hit Camden hard. According to current estimates, sea levels in the region will likely rise from 7.2 to 12 inches by 2030, up to 22 inches by 2050, causing river levels to rise as well.³¹ By 2100 sea levels could rise by 3.1 feet if global emissions are reduced or 4.5 feet if emissions are unchecked.

Camden is also projected to face more extreme storms and flooding. The city's aging infrastructure is already easily overwhelmed by heavy rainstorms, and the frequency, intensity, and severity of tidal flooding events will increase with sea level rise. By 2030, the 10-year storm event will result in flooding similar to that caused by Hurricane Sandy (a 100-year storm event). And by 2050, a Sandy-type storm event will cause inundations of about six feet. The sea level rise and storms anticipated in these forecasts will lead to chronic flooding or permanent inundation of the low-lying parts of Camden, especially in neighborhoods bordering tidal water bodies such as Waterfront South and Cramer Hill.³²

Other potential climate impacts include increases in mosquito-borne diseases, land subsidence, heat-related illnesses and injuries, worsening air quality, and decreased reliability in public transportation. Climate change is expected to lead to more frequent and intense heat waves. These impacts will likely create greater disparities between wealth and poverty as communities deal with increased environmental stress. Camden's houseless population is especially vulnerable to heat and air quality issues.

Siting of hazards

Camden has many communities facing environmental justice issues, leading to health risks and eroded trust in government. Waterfront South is emblematic of environmentally degraded neighborhoods with multiple health threats: in less than one square mile, there are two Superfund sites, 13 contaminated sites, four junkyards, a petroleum coke transfer station, a scrap metal recycler, a paint company, a chemical company, and other industrial facilities. Elected officials in the mostly affluent, white suburban county in which Camden sits pushed unwanted land uses into Waterfront South for decades. In 1978, Camden County expanded an existing wastewater plant in Waterfront South to process wastewater from 35 municipalities and built an open-air sewage-sludge composting facility and regional trash incinerator. While the location of the wastewater facility made sense from an engineering perspective, it created serious burdens for the community, and the CCMUA did not add odor control measures until 1999. Conditions have since improved significantly: the composting facility was closed and extensive odor control measures were implemented. However, the concentration of hazards shows a history of indifference to residents' health and wellbeing. For years, Waterfront South residents endured sewage odors, truck fumes, and noise, along with high rates of respiratory illness.

Public trust and education

Trust in government and water systems is a significant challenge in Camden because of ongoing environmental justice issues, high crime rates, disenfranchisement of communities of color, a legacy of political corruption, and a lack of government accountability. While some improvements have been made, the sting persists throughout communities in Camden. People often feel that the authorities are withholding information. Distrust of government agencies affects attitudes towards drinking water and has been exacerbated by incidences of brown tap water in homes and warning signs posted on school water fountains. Although Camden's water providers have distributed material showing that the water is safe, many residents are naturally reluctant to drink it and instead rely on bottled water.

There is a need for more public environmental education and engagement to build public trust. Because Camden is so under-resourced, there is a lack of government capacity to provide public education and outreach. Residents would benefit from increased awareness and knowledge of water systems and water issues.

PRIORITIES FOR ACTION

The water equity challenges in Camden are significant, but the city's utilities, community-based organizations, and government agencies are engaged in developing innovative solutions. By focusing on several key priorities and leveraging existing assets, Camden can make progress toward a more equitable water future.

Build on local achievements and partnerships

Despite Camden's environmental and economic challenges, the city has enormous social capital and capacity. Local stakeholders working to make water systems more equitable can build on the strides that have been made to install green infrastructure, develop new parks, and address environmental injustices. This work has been anchored by the Camden Collaborative Initiative (CCI), which was formed in 2013 by the City of Camden, Cooper's Ferry Partnership, the Camden County Municipal Utilities Authority, the NJDEP, and the EPA to maximize limited resources to improve quality of life and public health for residents. The CCI, which received EPA's Environmental Champion award in 2016 for exemplary public-private partnership, now has over 70 partners working on issues including combined sewage flooding, brownfields remediation, air emission reductions, environmental justice, environmental education, recycling, and illegal dumping. This initiative shows how much can be accomplished through collaboration between government agencies, utilities, community-based organizations, and others.

Priority action:

Expand multi-benefit green infrastructure to engage communities

The CCI has been especially successful in implementing the Camden SMART (Stormwater Management and Resource Training) Initiative, which has developed a citywide network of green infrastructure projects to reduce runoff and remediate environmental justice communities. The initiative, a collaborative effort of the City of Camden,

CCMUA, Coopers Ferry Partnership, Rutgers Cooperative Extension Water Resources Program, the NJ Tree Foundation, NJDEP, and many other institutions and community-based organizations, also advocates for policy change and offers training programs related to green infrastructure. Camden SMART has installed more than fifty green infrastructure projects throughout Camden's neighborhoods, including schoolyard rain gardens, public parks, and environmental remediation projects.

Green infrastructure provides an array of benefits: transforming Superfund sites and brownfields into community parks, making Camden more resilient to climate change, supporting economic development, and providing riverfront access. Green infrastructure is already creating jobs in Camden. The PowerCorps program, jointly managed by the Center for Family Services, the City of Camden, and CCMUA, employs young adults to maintain and remediate green spaces. Water equity advocates can build on this successful model of cross-sector partnership and multi-benefit projects to address issues like lead awareness, affordability, and workforce development. Camden's extensive green infrastructure can be a platform for engaging and educating communities on water issues, since it is visible throughout the city.

Ensure long-term water quality and awareness

Camden's water quality is dependent on several factors: reducing combined sewer overflows, removing lead service lines and fixtures from homes, and educating residents about the quality of their water. The city's utilities have committed to take action to reduce CSOs. Replacing all lead fixtures and pipes and raising awareness on how to avoid lead exposure in the meantime are both urgent actions needed to prevent health risks, but low-income households often lack the proper information, capacity, and resources to accomplish this. Furthermore, due to a history of environmental injustice, trust has deteriorated and communication between utilities and

water users must overcome serious barriers. Education and outreach campaigns to build public understanding of water quality are necessary to forge trust.

Priority Action:
Support follow through of combined sewer overflow reduction plan

Camden's utilities have committed to reduce combined sewer overflows significantly. The city government, CCMUA, and American Water are working together on several initiatives to accomplish this goal. Rehabilitation is underway to clean silt out of the sewer system and increase its capacity. Camden's sewer system is being expanded to convey more of the flow to the CCMUA's treatment plant, which is also being expanded to process more wastewater. These measures will reduce neighborhood flooding and lessen the burden on vulnerable communities. Camden's green infrastructure initiatives are also a strategy to address flooding by absorbing and reducing stormwater volumes. These projects, supported by regular maintenance, are expected to eliminate flooding for one-year storm events by the end of 2020. This will improve water quality in the long term. All stakeholders, including local organizations, other agencies, and the public can hold the utilities accountable to this goal by requesting progress updates and information.

NJDEP and EPA have provided significant funding for water infrastructure projects through the New Jersey Water Bank and New Jersey Infrastructure Bank and EPA's state revolving loan fund. The CCMUA and city of Camden will need the NJDEP and EPA to continue to be strong financial and technical partners to achieve these planned sewer overflow reductions.

Priority Action:
Create a comprehensive lead awareness campaign

Making clear information on lead exposure and risks in schools and homes accessible to the public is crucial. Residents may be receiving conflicting information on the presence of lead, leading to unnecessary anxiety. Conducting extensive outreach to share information on minimizing lead exposure is a key strategy for building public trust in drinking water. To this end, CCMUA and Camden SMART are making a concerted effort to inform the public about lead exposure and safety, explaining that letting water run to flush out pipes can reduce risk. CCMUA has worked with the Camden School District

and the County Board of Health to distribute refrigerator magnets and educational materials to students and teachers, as well as sending information in the mail. New Jersey American Water and American Water also include lead information in customer bill inserts and postcards, as well as in handouts at events and online.

Moving forward, these materials can be expanded to create an engaging lead awareness campaign that includes digital communications as well as strategies to reach people that do not have access to technology, like radio, mailers, billboards, and open house events. Materials should be available in commonly spoken languages in order to reach everyone and ensure adequate understanding of risk. Utilities can engage youth groups to collaborate on designing engaging materials like video and social media. Working with youth on lead awareness is also an opportunity to expose them to careers in the water sector and can be connected to workforce development programs. This effort could be tied to statewide lead issues, as CCMUA is working with the New Jersey Environmental Justice Advisory Council to develop a statewide lead awareness program. It could also align with initiatives working to reduce exposure to lead paint.

Priority Action:
Assist residents in replacing lead components

Educating the public about minimizing the risk of lead exposure is the first step; the second is to assist residents with replacing lead components. The city of Camden has some data on the locations of lead service lines in the city, but it may be outdated. Local stakeholders could focus on updating and sharing this data with residents. Utilities can assist with identifying and replacing lead service lines as they conduct replacement of water mains. Outreach, identification, and replacement strategies could be linked to other existing programs, such as weatherization programs.

If lead components are identified, residents may need financial assistance to replace them. Lead service lines and fixtures are the property owner's responsibility, but utilities can take the lead in protecting public health by helping connect low-income people to funding and technical assistance for replacement. Local stakeholders should identify and share state and federal resources for lead component replacement. Jersey Water Works has convened a statewide lead taskforce that is advocating for

the use of State Revolving Funds (SRFs) for lead service line removal. While SRFs are often loans, they can be offered as grants for economically distressed municipalities. The city of Camden may be able to qualify for SRFs that are primarily grants to replace lead service lines. This would reduce the cost burden on low-income people and make it easier to get lead out of the system entirely.

Priority Action:

Advocate for lead disclosure policies

Removing lead service lines and fixtures is challenging because residents, especially renters, often do not know if they are present. Federal regulations require property owners to inform tenants or home buyers about lead paint in rental and sales agreements; a similar policy could be extended to lead fixtures and lines. If residents were better informed about lead, they would be able to take action to protect their health by flushing their pipes, using filters, or removing lines. Lead disclosure policies could also require landlords to test tap water for lead regularly, and tax incentives could be offered to compensate landlords for complying. New Jersey does not currently require disclosure of lead service lines, but other states offer policy models. For example, New York state requires sellers to disclose whether there is lead plumbing in the home and where components are located.³³

Keep water rates affordable for all residents

As previously mentioned, Camden residents receive discounted sewer rates as a host community benefit because the wastewater treatment plant for the whole county is located within their city. This measure keeps rates fairly affordable. However, rates may still be a burden for some low-income residents. Moreover, the rate discount is only applicable to homeowners; renters are not eligible. Income-based rate discounts are an equitable approach to keeping rates affordable to the most vulnerable.

Priority Action:

Advocate for statewide legislation allowing for income-based rates

In their efforts to develop programs to make water and wastewater services affordable, utilities must navigate a complex, confusing, and ambiguous legal framework that varies considerably from state to state. Public water utilities in New Jersey are required to charge customers for their water services but are not allowed to subsidize low-income customers at the expense of high-income customers. This means that Camden's utilities cannot offer income-based discounts to lower-income ratepayers.³⁴ Utilities and other Camden stakeholders can advocate to change this policy to allow utilities to consider income when they set rates. This is legal in many states, including New York. Changing this policy at the state level would allow Camden's utilities to set more equitable, affordable rates for low-income people, while also ensuring higher rates of consistently paid bills.

Ensure that equity concerns are central to climate planning and investment

Climate planning is in its early stages in Camden, and the general public is not very aware of the climate risks. This is an opportunity to ensure that climate planning and investment in Camden is equitable and community-driven from the start. In addition, the fact that Camden's population is largely made up of vulnerable communities means that the need for planning is itself a climate equity issue. Camden's high levels of poverty and unemployment mean that the population is especially vulnerable to climate impacts such as natural disasters. Rising river levels and more frequent and erratic precipitation will exacerbate challenges like flooding and CSOs that already disproportionately affect vulnerable communities. Building community resilience, and adaptation efforts that focus on vulnerable populations, is essential.

Water and wastewater utilities use a tremendous amount of energy in their operations, which creates an opportunity to move towards more resilient infrastructure. The Camden County Municipal Utilities Authority, with financial and technical support from the New Jersey Board of Public Utilities (BPU) and the NJDEP, is making bold strides to become more resilient by transitioning operations to

renewable energy. CCMUA, with continued support from BPU and NJDEP, is currently modifying its wastewater treatment plant to use only self-generated energy by the summer of 2020. The utility is planning to create a microgrid to provide lower-cost, resilient electricity to public housing, schools, city hall, the drinking water plant, the fire department, and other public entities. CCMUA would also be able to provide energy to private sector entities like hospitals during power outages and emergencies, making them more resilient. This initiative can be expanded and publicized to bring awareness to climate impacts in Camden. Moreover, the city's green infrastructure projects aimed at reducing CSO impacts are also a resilience measure and can be expanded to address rising river levels.

Priority Action:

Compile data and map climate impacts on vulnerable communities

Climate planning in Camden will require significant research on the impacts the city faces. It is important to build equity indicators into the research at this stage in order to understand how vulnerable communities will be affected. Camden SMART has mapped flooding in relation to population density (to prioritize green infrastructure sites), but not equity indicators like income, senior citizen population, or languages spoken. This research could be expanded to trace correlations between flooding and poverty. Camden stakeholders can partner with research institutions in the region to collect and analyze climate data.

Priority Action:

Create a citywide equitable climate resilience plan

Climate vulnerability data can inform the development of a citywide climate resilience plan for decision-making and funding for all departments. This plan should include equity indicators to direct adaptation measures and funding towards the vulnerable areas identified by mapping. It could restrict waterfront development in areas that would exacerbate flooding in vulnerable communities. The plan could encompass resilience strategies such as harnessing alternative energy sources like wind, solid waste, tidal energy, and wastewater, since Camden is already leading on the transition to clean energy.

There is significant state-level mobilization around climate adaptation in the wake of Hurricane Sandy. Camden's plan should build on this work, leveraging existing data and strategies available in the NJDEP's coastal resilience plan and working to scale these to local conditions. Camden is often overlooked in climate discussions because it is on the western side of New Jersey. Highlighting its vulnerabilities, current resilience measures, and future adaptation needs would raise its profile for state-level funding opportunities. The city of Camden, with the input of NJDEP and other experts in climate-related impacts, should understand the progressive effects of climate change and sea-level rise and develop plans to mitigate the impacts of rising water, more severe storms, and other adverse conditions related to climate change. The city should develop ordinances that consider the predicted impacts of climate change. There also needs to be strong education and outreach around climate change so local officials, residents, businesses and institutions all understand what future conditions are anticipated in the city. The outreach effort could be initiated by holding a citywide climate summit to raise awareness of the need for climate adaptation among residents and policymakers.

Priority Action:

Implement a stormwater fee to fund climate adaptation measures

Climate planning and adaptation is necessary, but often comes with high upfront costs. Implementing a stormwater fee would create a new funding source that could support equitable climate planning. This would primarily affect businesses with large impermeable surfaces, like parking lots, rather than individual residents. Currently, companies do not pay a fee for runoff from large impermeable lots, meaning that the city does not receive revenue to manage stormwater and flooding. The City of Camden or CCMUA—or both—can use a stormwater fee to generate revenue for climate planning and adaptation strategies like green infrastructure.

Camden's neighbor across the river offers a successful example of this strategy: the city of Philadelphia assesses stormwater impact fees to car dealerships, retail stores, and other properties with large impermeable surfaces. These property owners are given the option of installing green infrastructure to reduce their impact, and many are eager to do so. The city has effectively used this strategy to scale up green infrastructure and reduce runoff.

Build an inclusive water workforce

The US water workforce is changing—according to EPA, over 30 percent of water workers will retire in the next decade. There is a need to train, hire, and retain new positions. Utilities are also finding value in hiring for non-traditional types of positions. For instance, there is an increased need for better communication and engagement to build trust with residents. As utilities grapple with climate impacts and cumulative environmental challenges, many have created sustainability officer positions. In short, there is a need for expertise at utilities beyond traditional engineers and operators, such as people with interdisciplinary backgrounds in communications, sustainability, and policy. All of this creates the possibility of building a local, diverse, and inclusive workforce.

This shift in the sector presents an important opportunity for low-income populations, as many of these positions offer good salaries and have varying educational requirements.³⁵ However, some local workers face barriers because they have criminal records, or because they cannot afford to join training and educational programs without receiving a salary. Camden water utilities have limited resources to launch new recruitment pathways and sustain training programs.

The Camden County Municipal Utilities Authority employs only 130 workers but operates one of the largest wastewater treatment plants in the Northeast and monitors over 135 miles of pipes.³⁶ Over half of CCMUA's employees will be eligible for retirement in the next five years. While CCMUA can't provide jobs to everyone, the water workforce is more than just one utility. CCMUA is reaching out to regional and community partners to jointly connect workers and new jobs to tackle the infrastructure and economic challenges in the region.

CCMUA serves on a national water workforce initiative led by EPA, the National Association of Clean Water Agencies, the Association of Metropolitan Water Agencies, and the Water Environment Federation. This initiative aims to help community colleges and technical and vocational high schools develop curricula that can serve as pipelines from communities into utilities, as well as working with credentialing agencies to make sure that they will recognize graduates of training programs.

Priority Action:

Partner with schools to educate youth about water sector careers

Many young adults never consider pursuing water utility careers because they are unfamiliar with the sector. Teaching students about the value of water and the importance of their city's water infrastructure early in their education means that they will see the water sector as a potential career path. CCMUA currently partners with schools to take students on tours of the wastewater treatment plant and introduce them to water infrastructure. Building on this, utilities can partner with schools to develop STEM curricula at all levels of education, from elementary school to college, as well as technical schools and vocational training programs. American Water recently provided a \$200,000 grant to the Camden School District to create a STEM center in Camden High School, which will become a center for this type of learning. Demonstrating to students that the water sector provides stable, well-paid, fulfilling careers could help address the dropout rate. Tying material on infrastructure to environmental and social justice could also make it more engaging and meaningful to students.

Priority Action:

Create a green job center for Camden youth

Young adults that are interested in the water sector need wraparound support to secure good jobs. In addition to technical training, they may need assistance with resumes, interviews, and soft skills. Creating a green job center for Camden youth would help build a career pipeline for the local water workforce. The center could provide training for an array of sustainability and resilience fields, including green infrastructure, clean energy, and environmental remediation. The center could work with other vulnerable populations like veterans, formerly incarcerated people, and houseless people. Camden's Workforce Development Board could support this effort and connect it to other opportunities and services.

CCMUA can contribute to creating youth employment opportunities by building upon their existing workforce development initiatives. For example, the Green Ambassador program hires 20 Camden high school students every summer to introduce them to environmental careers. This program can be expanded to include more students. The utility is also creating pathways to water sector employment through the PowerCorps program, a job training initiative focused on green infrastructure. CCMUA has already hired four program

participants. The program places more than half of its participants in jobs, and the CCMUA can work with other local stakeholders to improve that placement ratio.

Priority Action:

Create an employer-driven employment pipeline

Workforce development initiatives like trainings and apprenticeships are only effective if employers are hiring for related positions. Workforce programs in Camden should be informed by existing employment opportunities and match skilled job seekers to positions. Camden's public and private sector employers should aggregate their open positions in an accessible, public format. Organizations that offer job training should coordinate with employers to match their offerings to projected future employments needs. This can go alongside advocating for policies that incentivize local hiring, which could be tied to subsidies for locating in Camden. Credentialing agencies should be consulted to ensure that trainings meet their qualifications. The Workforce Development Board could also support this action.

Strengthen policies to evaluate cumulative environmental and equity impacts

Water equity in Camden is best understood through the framework of cumulative impacts. For example, a family living near a combined sewer overflow site may experience frequent flooding, where their front yard fills with stormwater and wastewater. Viewed in isolation, this is a nuisance. However, understanding the array of stressors and risks that vulnerable communities are subject to shows the depth of the challenge. Low-income residents cannot afford to miss a day of work to deal with flooding. If public transit is delayed by flooding, they may not be able to get to work or school at all. If their homes are damaged, they may not have the funds to make repairs. The health risks associated with wastewater flooding may exacerbate other health conditions caused by poor air quality and pollution. Given the number of environmental hazards in the city and the rates of economic distress, it is crucial to take cumulative impacts into account in making equitable decisions.

In 2015, Camden's City Council adopted a Sustainability Ordinance that requires planners to consider environmental sustainability, public health, and resident wellbeing as they review proposed developments.³⁷ It also recommends that developments include measures to mitigate environmental impacts, such as installing green infrastructure. This ordinance is an important tool in protecting the city from hazardous and inequitable developments, but it has not yet been used to its full potential. It should be enforced more broadly and stringently and expanded to include climate impacts.

Priority Action:

Require cumulative impacts assessment for new developments at the state level

Camden's ordinance offers a good model for evaluating cumulative impacts at the state policy level. Camden has a disproportionate concentration of pollution-emitting facilities and contaminated sites. These facilities were approved by local government and subsequently permitted by the NJDEP, despite community opposition. While this is a local land use issue, the NJDEP can also take an active role in safeguarding public health and preventing environmental injustices. NJDEP and EPA should take a broader view of environmental impacts to include undue burdens on vulnerable communities. NJDEP, along with the New Jersey Department of Health (NJDOH), should provide available environmental and health data to better understand the source(s) and impacts of these facilities and sites. NJDEP, NJDOH and EPA can help to create a policy that considers cumulative impacts of pollution sources. This policy could build on Camden's Sustainability Ordinance that could help ensure that cumulative impacts are always taken into consideration.

CONCLUSION

Building a more equitable water future for Camden is a collaborative effort. The city has a successful track record in creating partnerships, demonstrating that all stakeholders have a role to play. Collaboration between utilities, government agencies, youth, community organizations, researchers, environmentalists, and residents is needed to truly achieve an equitable water future. Equitable water management strategies will address the legacy of past environmental and economic stressors and recognize the strength and resilience of Camden's communities. While the challenges are significant, Camden stakeholders have the expertise, imagination, and collaborative capacity to create a city where all people benefit from safe water, vibrant green spaces, and resilient water systems.

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