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How to Combat Post-Natural Disaster Related Environmental Gentrification and Environmental Inequality Accelerated by Climate Change

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How to Combat Post-Natural Disaster Related
Environmental Gentrification and Environmental Inequality
Accelerated by Climate Change

By

Marielle Christie

Submitted in partial fulfillment
of the requirements for the degree of
Bachelor of Science/Arts
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Abstract

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This thesis aims to illustrate the concept of natural disaster-induced environmental gentrification. There is a heightened vulnerability to unmitigated forced displacement by socioeconomically disadvantaged residents following a natural disaster. Environmental gentrification is a variant of green gentrification. Green gentrification occurs when providing green amenities to a city increases local property values and attracts wealthier residents to a previously polluted or disenfranchised neighborhood, which displaces the low-income residents. Similarly, environmental gentrification is a process that occurs after a natural disaster and rapidly accelerates the process of traditional urban gentrification or green gentrification. As a result, environmental gentrification magnifies and facilitates further the underlying socioeconomic and environmental inequality already in place at the time of disaster.

This thesis presents two case studies in which exemplify environmental gentrification post-natural disaster. The two case studies are New Orleans in the wake of Hurricane Katrina and New York City in the wake of Hurricane Sandy. The overall objective of combating the effects and continued occurrence of environmental gentrification post-natural disasters is the materialization of a more complete democratic vision of climate change resiliency planning and policymaking. Resiliency planning requires that the concerns of all potentially affected residents are addressed through the cooperation of all government levels and the private market to ensure egalitarian

opportunities for participation in planning and policymaking process. Through mutual responsibility and transparent presentation of policies the outcome is the creation of an equitable environment for all potentially affected people and property.

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Literature Review

Hurricane Sandy was the deadliest and most destructive hurricane of the 2010 Atlantic hurricane season and the second-costliest hurricane in United States history. Sandy was a Category 3 storm at its peak intensity when it made landfall in Cuba and a Category 2 storm off of the coast of the Northeastern United States. It became the largest Atlantic hurricane on record with winds reaching up to 1,100 miles. Estimates as of 2015 assess the damage to be about \$71 billion in total, surpassed only by that of Hurricane Katrina in 2005 which was \$125 billion.¹ At least 233 people were killed along with the path of the storm in eight countries, most of whom drowned.² Hurricane Sandy reached the United States on October 29, 2012 and it was credited with being the largest storm ever recorded in the Atlantic Ocean because it reached greater than 1,000 miles in diameter³ and affected every state on the East Coast from Maine to Florida. Within the United States, Hurricane Sandy affected total of 24 states along the entire eastern seaboard as well as west across the Appalachian Mountains to Michigan and Wisconsin. Severe damage was caused in New Jersey and New York, flooding streets, tunnels and subway lines and cutting power in and around major cities. The cost of damage in the United States is estimated to be about \$65 billion.⁴ The estimated cost of damage from Hurricane Sandy was totaled at \$71 billion in New York State alone, including \$9 million for preventative work.⁵ While these numbers are staggering they do not begin to explain the damage done to the lives of those who fell victim to Hurricane Sandy. In New York

¹ Newman, Andy, "Hurricane Sandy vs. Hurricane Katrina," *The New York Times* (2012).

² Ibid.

³ Manuel, John, "The Long Road to Recovery: Environmental Health Impacts of Hurricane Sandy," *Environmental Health Perspectives* (2013): A153.

⁴ Ibid.

⁵ Ibid.

City alone, over 305,000 housing units were damaged or destroyed and in a total of 16 states 8.51 billion homes were left without power.⁶ However, unlike Hurricane Katrina, which caught leaders at all levels of authority unprepared, the well-established wide net of government agencies in place in New York City was well-equipped to handle the health and security threats posed by Hurricane Sandy. Not only were there immediate and devastating effects of the storm but also long-lasting struggles for the neighborhoods and residents affected by the hurricane. Most notably many New York City residents were displaced and left without a roof over their heads in the months and years following Hurricane Sandy. This results in a long-term effect that has not yet been properly planned and prepared for with regard to natural disaster aftermath and has been echoed throughout the history of natural disasters in the U.S., including throughout the aftermath of Hurricane Katrina in New Orleans five years prior to Hurricane Sandy.⁷

Previous to Hurricane Sandy, on August 29, 2005 Hurricane Katrina, the costliest natural disaster in U.S. history, touched down on the Gulf Coast of the United States, east of New Orleans, Louisiana. Winds reached a maximum of 175 miles per hour and storm surge peaked at 32 feet tall as the storm gained fuel over the Gulf of Mexico and swiftly created a hurricane that is now understood to have been the worst case scenario for the city of New Orleans. The technological and meteorological catastrophe resulted in the death of over 1,800 people, damaged 2.5 million homes, and displaced more than 1.2 million people.⁸ A result of the mass displacement of peoples is the largest forced migration of the American population since the Dust Bowl in the 1930s. The economic

⁶ Newman, Andy, "Hurricane Sandy vs. Hurricane Katrina".

⁷ "A History of Major Storms in NYC", *NBC New York* (2012); US Department of Commerce, and NOAA, "The Great New England Hurricane of 1938," *National Weather Service* (2018).

⁸ Erikson, Kai T., *The Sociology of Katrina Perspectives on a Modern Catastrophe* (Rowman & Littlefield Publishers, 2007), 23; Newman, Andy, "Hurricane Sandy vs. Hurricane Katrina,".

damage of Hurricane Katrina was projected to reach \$300 billion which would make it the most costly natural disaster in U.S. history.⁹ Damages did not actually climb to \$300 billion but Hurricane Katrina is still considered the most costly natural disaster with damages reaching upwards of \$125 billion.¹⁰

Hurricane Katrina was a natural disaster that not only virtually cleared an entire city but also revealed the lack of preparedness and planning that is required for the inevitable increased rate of natural disasters accelerated by climate change. Federal, state, city and local officials were scrutinized for their lack of preparedness and inability to act quickly and swiftly in order to ensure safety for all residents of New Orleans.¹¹ Not only was New Orleans inadequately prepared but also the ineffectiveness of the city's so-called "flood resilient" levee system proved another failure to plan and mitigate for natural disasters and flooding events.¹² Following Hurricane Katrina, residents were faced with a multitude of failures by public and private disaster-relief services. The result was the immense dissatisfaction amongst minority residents because Hurricane Katrina magnified and emphasized systematic segregation of residents based on race and socioeconomic status and revealed, yet again, the constant failure of public entities to fulfill basic requirements such as proper preparedness for catastrophic events. The long-term displacement pattern that has been recognized as one of the most damaging effects of a natural disaster is caused by many factors including the vulnerability of minority

⁹ Erikson, *The Sociology of Katrina*, 19.

¹⁰ Van Holm, Eric Joseph, and Christopher K Wyczalkowski, "Gentrification in the Wake of a Hurricane: New Orleans after Katrina," *Urban Studies* (2018): 2.

¹¹ Shears, Andrew B., "Hurricane Katrina and New Orleans: Discursive Spaces of Safety and Resulting Environmental Injustice," *Kent State University* (2011): 169-170; Horton, Hayward Derrick, et al., "After the Storm: Race and Victim's Reactions to the Hurricane Katrina Aftermath," *Reinventing Race, Reinventing Racism* (Haymarket Books, 2012), 105.

¹² Shears, "Hurricane Katrina and New Orleans," 8; Rogers, J. David, "Historical Background on the New Orleans Levee System," *Natural Hazards Mitigation Institute at University of Missouri-Rolla*; Nelson, Stephen A., "Hurricane Katrina - What Happened?" *Tulane University* (2007): 48.

residents to obtain adequate insurance, protection, relief funding and political voice during times of distress or disaster. Again, a pattern echoed by natural disasters past, present and future.¹³

As a result of the varying effects imposed on a city throughout the aftermath of a natural disaster, such as Hurricanes Katrina and Sandy, the ingredients to the perfect recipe for environmental gentrification are presented on a silver platter. This thesis aims to illustrate the concept of natural disaster-induced environmental gentrification. There is a heightened vulnerability to unmitigated forced displacement by socioeconomically disadvantaged residents following a natural disaster. Environmental gentrification is a variant of green gentrification. Green gentrification occurs when providing green amenities to a city increases local property values and attracts wealthier residents to a previously polluted or disenfranchised neighborhood, which displaces the low-income residents. Similarly, environmental gentrification is a process that occurs after a natural disaster and rapidly accelerates the process of traditional urban gentrification or green gentrification. As a result, environmental gentrification magnifies and facilitates further the underlying socioeconomic and environmental inequality already in place at the time of disaster. This thesis presents two case studies in which exemplify environmental gentrification post-natural disaster. The two case studies are New Orleans in the wake of Hurricane Katrina and New York City in the wake of Hurricane Sandy. The overall objective of combating the effects and continued occurrence of environmental gentrification post-natural disasters is the materialization of a more complete democratic vision of climate change resiliency planning and policymaking. Resiliency planning

¹³ Twigg, David K., *Politics Of Disaster: Tracking The Impact Of Hurricane Andrew* (University Press of Florida, 2012).

requires that the concerns of all potentially affected residents are addressed through the cooperation of all government levels and the private market to ensure egalitarian opportunities for participation in planning and policymaking process. Through mutual responsibility and transparent presentation of policies the outcome is the creation of an equitable environment for all potentially affected people and property.

First, it is important to understand the concept of gentrification in its entirety, meaning there are several different versions of the concepts which are caused by many different limiting factors. Gentrification can be defined as the conversion of socially marginal and working-class areas of the central city to middle-class residential use.¹⁴ The most common explanation of this urban gentrification is the attractiveness of the low-priced housing in the mentioned “working-class areas of the central city”, however, the pricing characterized as “low” is relative to the buyer who typically holds middle- or high-socioeconomic status. As word spreads about a neighborhood with low-priced housing among middle- and upper-class buyers that is when the process of gentrification begins. Middle- and upper-class residents begin to populate the area, housing prices rise and the lower-income residents that were originally residing in that particular area or neighborhood are displaced because they can no longer afford the rising housing prices. Throughout history, a major physical indicator of gentrification in urban centers is in the architectural restoration of previously deteriorating housing and the clustering of new cultural amenities in the urban core.¹⁵

However, it is important to recognize that there is not only one definition of “gentrification” because there are many different types, causes and effects that it is

¹⁴ Zukin, Sharon, “Gentrification: Culture and Capital in the Urban Core,” *Annual Review of Sociology* 13 (1987): 129.

¹⁵ Zukin, “Gentrification,” 129.

impossible to create such a description that would encompass all. Gentrification is also difficult to define, identify and measure its effects and reach a judgement about whether it is good or bad. For example, some definitions emphasize the displacement of existing residents. Others characterize gentrification as a process of renewal or revitalization. Some definitions point to the change in a neighborhood's character. Still others see changes in property values as an essential element of gentrification. There is much disagreement over the effects of gentrification. The proponents of gentrification usually focus on aggregate effects, which, on balance, seem to be positive. Opponents of gentrification typically focus on the distributional impact and point out how the negative effects are likely to fall disproportionately on the poor. They may both be right, but progress on the debate is hindered by a shortage of good empirical evidence.

Gentrification, then, seems to pose the common problem of balancing a modest benefit to many against the significant burden imposed on a small, often vulnerable, few.¹⁶

However gentrification is viewed, positively or negatively, the policy implementations based on gentrification patterns have significant implications for cities and urban neighborhoods with varying socioeconomic statuses. To summarize, the categorization of a specific type of gentrification is largely based on the outcome and long-lasting effects of the practice in an urban center. This explanation can be used in the context of a natural disaster. Instead of properties deteriorating slowly over time, there is rapid destruction of housing, cleared land, displacement and vulnerability of residents which commences the process of environmental gentrification.

Similarly, there are several types of nature- and environment-related categories of gentrification. One of which is labeled as "green gentrification" and can be defined as a

¹⁶ Holland, Steve, "Gentrification: Causes and Consequences," *Journal of Lutheran Ethics* (2016).

subset of urban gentrification in a process brought on by state-sponsored greening initiatives that create or restore environmental amenities which draws in a wealthier demographic and pushes out lower-income incumbent residents resulting in gentrification.¹⁷ Another term used to describe a similar concept to environmental and green gentrification is “ecological gentrification” is the implementation of an environmental planning agenda related to public green spaces that leads to the displacement or exclusion of the most economically vulnerable human population because the real estate becomes more valuable thus making it more attractive to wealthier classes and unobtainable to lower-class citizens.¹⁸ In the past, studies of the social and environmental impacts of well-intentioned urban greening initiatives show correlation between increased environmental amenities and socioeconomic inequality amongst residents.¹⁹ It has been previously suggested that the ideal prescription for urban centers when attempting implement greening initiatives is to design plans and policy changes that are aimed at socio-ecological change that will result in mutually exclusive benefits for residents of all socioeconomic statuses and the environment.²⁰ However this prescription is rarely filled and more often than not capitalism, governmental actors, racism and classism work together to produce environmental gentrification and exclusion through land speculation, green initiatives, and revitalization projects, such as post-disaster redevelopment.

¹⁷ Gould, Kenneth A., and Tammy L. Lewis, *Green Gentrification: Urban Sustainability and the Struggle for Environmental Justice* (Routledge Taylor & Francis Group, 2017), 23.

¹⁸ Dooling, Sarah, “Ecological Gentrification: A Research Agenda Exploring Justice in the City,” *International Journal of Urban and Regional Research* 33 (2009): 622.

¹⁹ Dooling, “Ecological Gentrification,” 625; Checker, Melissa, “Wiped Out by the ‘Greenwave’: Environmental Gentrification and the Paradoxical Politics of Urban Sustainability,” *City & Society* 23 (2011): 210.

²⁰ Dooling, “Ecological Gentrification,” 630; Anguelovski, Isabelle, and Joan Martínez Alier, “The ‘Environmentalism of the Poor’ Revisited: Territory and Place in Disconnected Glocal Struggles,” *Ecological Economics* 102 (2014): 174.

Consequently, an unforeseen outcome of natural disasters is the availability of open land and real estate which allows for the implementation of environmental gentrification. Of course, this availability of land is not exploitable without the widespread displacement that also occurs after a natural disaster such as Hurricane Katrina. Many scholars and studies argue that this opportunity for gentrification and the consequential displacement was occurring in New Orleans, as a result of systematic racism, long before Hurricane Katrina and was just accelerated as a result of a major climate event.²¹ The history of racial discrimination and dysfunctional government in New Orleans caused disproportionate assistance post-Hurricane Katrina in many areas of society including ill-advised flood control programs, residential segregation, and a disconnected federalism or total failure of government.²²

Similarly the idea of residential segregation and environmental vulnerability with regard to the strategic placement of minority and low-income populations in flood zones and leaving the flood zone areas with little chance of evacuation.²³ Evacuation as a choice was an idea created by the media to project to the rest of the world so everyone else would believe that poor and African American survivors chose to stay in their destroyed homes rather than disclosing the truth of the lack of rescue efforts in the low-

²¹ Marable, Manning, and Kristen Clarke, *Seeking Higher Ground: the Hurricane Katrina Crisis, Race, and Public Policy Reader* (Palgrave Macmillan, 2008); Squires, Gregory D., and Chester Hartman, *There Is No Such Thing as a Natural Disaster Race, Class, and Hurricane Katrina* (Routledge, 2006); Wailoo, Keith, et al., *Katrina's Imprint: Race and Vulnerability in America* (Rutgers University Press, 2010); Weber, Lynn, and Lori A. Peek, *Displaced: Life in the Katrina Diaspora* (University of Texas Press, 2012); Fussell, Elizabeth, "The Long-Term Recovery of New Orleans' Population After Hurricane Katrina," *American Behavioral Scientist* 59 (2015).

²² Wailoo et al., *Katrina's Imprint*, 134.

²³ Barnshaw, John, and Joseph Trainor, "Race, Class, and Capital amidst the Hurricane Katrina Diaspora," *The Sociology of Katrina: Perspectives on a Modern Catastrophe* (Rowman & Littlefield Publishers, Inc., 2007).

income neighborhoods in New Orleans.²⁴ This media presence also brings light to the controversy during media coverage during the aftermath of Hurricane Katrina and the use of the word “refugee.” Perceptions and correlation associated with the use of the word “refugee” in terms of socioeconomic status during the evacuation stages pre- and post-hurricane showed that as a result of the victims of Hurricane Katrina being referred to as “refugees” in the media there was a widespread refusal to, not only be considered as second-class citizens or foreigners in their own country, but also a refusal from the rest of the country to admit that New Orleans residents has been failed by the U.S. government.²⁵ Displaced residents looking to return to New Orleans post-hurricane Katrina had lower odds of owning their homes, living in detached homes, and accessing primary health care facilities, it was coming clear that access to affordable housing was unlikely for displaced residents in the aftermath of Hurricane Katrina because it was not a top priority in the reconstruction and redevelopment plan.²⁶ The history of the vulnerability of black residents living in New Orleans and concluded that the population is already at-risk due to the embedded racism so the damage brought on an event like Katrina exaggerates the effects of this segregation.²⁷ Hurricane Katrina resulted in a community that is vulnerable to coercion as a result of the combination of the history of systematic racism, heightened vulnerability of minority populations, environmental injustice, lack of government preparedness or direction, unchanging socioeconomic

²⁴ Barnshaw and Trainor, “Race, Class, and Capital amidst the Hurricane Katrina Diaspora”.

²⁵ Gemenne, Francois, “What's in a Name: Social Vulnerabilities and the Refugee Controversy in the Wake of Hurricane Katrina,” *Environment, Forced Migration and Social Vulnerability* (Springer, 2010), 35.

²⁶ Hori, Makiko, and Mark J. Schafer, “Social Costs of Displacement in Louisiana after Hurricanes Katrina and Rita,” *Population and Environment* 31 (2009): 68; Stringfield, Jonathan D., “Higher Ground: an Exploratory Analysis of Characteristics Affecting Returning Populations after Hurricane Katrina,” *Population and Environment* 31 (2009): 45.

²⁷ Seicshnaydre, Stacy, et al., “Rigging the Real Estate Market: Segregation, Inequality, and Disaster Risk,” *The Data Center* (2018).

statuses, lack of financial security, and the attractiveness of newly open land.²⁸ This mix of negative underlying societal factors set a perfect stage for the implementation of environmental gentrification in New Orleans as it has begun to manifest in the post-Hurricane Sandy New York City and will continue in other cities faced with natural disasters.

Scientists and environmentalists have known for years that climate change is and will continue to cause Arctic ice caps to melt due to increased carbon dioxide in the atmosphere which will result in sea level rise causing many coastal lands to become permanently inundated. Some of the at-risk coastal communities are New Orleans and New York City.²⁹ Cities across the globe are at risk for increased infrastructure damage due to increased natural disasters brought on by climate change. Some cities are working to combat this impending damage by becoming more resilient, while others will inevitably fall victim to the force of climate change. The leading factors that contribute to increased environmental degradation caused by natural disasters are failure to address the issue of said environmental damage and disaster risk prior to disasters.³⁰ A lack of government control, lack of financial resources, severe population growth, and the lack of community participation in policy formulation in urban centers will continue to lead to increased destruction as climate change continues. However, some coastal cities are working to combat this destruction by creating public policies hoping to adapt to changing conditions that are accelerated by climate change. New York City's and London's public policy regarding climate change adaptation has evolved over time from

²⁸ Erikson, *The Sociology of Katrina*, 22.

²⁹ Bukvic, Anamaria, and Graham Owen, "Attitudes towards Relocation Following Hurricane Sandy: Should We Stay or Should We Go?" *Disasters* 41 (2016): 101.

³⁰ Pelling, Mark, *The Vulnerability of Cities: Natural Disasters and Social Resilience* (Routledge, 2003).

2003 to 2013 because each city understood the implications of increased threat of natural disasters due to climate change and developed strategies through interactions between policy planners, government officials, and scientists.³¹ Resiliency efforts began in each city during this decade and their policies are continuing to evolve and adapt.

The vulnerability of New York City to coastal hazards caused by climate change, includes sea-level rise and more frequent tropical storms, and so it is necessary for New York City to continue to grow and modernize its infrastructure to combat the effects of climate change so as to avoid major consequences to the city's economic activity, public safety and health. Early projections of sea-level rise predicted sea level to rise between 0.24 and 1.08 meters by the year 2100 which seemed unlikely and worst-case scenario in 2007 at the time of prediction.³² It was understood that current and future assets of New York City and surrounding areas needed to remain secure and the city needed to maintain its reputation as a safe and attractive global center for commerce, trade, culture, education and diplomacy so it was necessary to implement a long-term plan for coastal risk management, planning, and mitigation.

Many major urban centers have been proposing climate change adaptation plans over the past decade, including New York City, but these efforts were accelerated in 2010 when Hurricane Sandy hit the city causing major damage and devastation in the area. Climate change adaptation emerged in the New York City public policy realm in 2013 with the implementation of former New York City mayor, Mayor Bloomberg's, Special

³¹ Solecki, William, et al., "Urban Climate Change Policy Transitions," *The Adaptive Challenge of Climate Change* (Cambridge: Cambridge University Press, 2015), 41-42.

³² Jacob, Klaus, et al., "Vulnerability of the New York City Metropolitan Area to Coastal Hazards, Including Sea-Level Rise: Inferences for Urban Coastal Risk Management and Adaptation Policies," *Managing Coastal Vulnerability* (2007): 145; Kemp, Andrew C., and Benjamin P. Horton, "Contribution of Relative Sea-Level Rise to Historical Hurricane Flooding in New York City," *Journal of Quaternary Science* 28 (2013).

Initiative of Rebuilding and Resilience (SIRR) which focused on assessing the damage from Hurricane Sandy and understanding how future climate change might influence the level of coastal risk and promoting resiliency efforts in New York City's neighborhoods most at risk of current and future flooding.³³

Since the occurrence of Hurricane Sandy there has been some, but not enough, widespread adaptations to move populations away from coastal areas, including the New York City metro area.³⁴ More realistically, there needs to be a greater pressure put on policymakers to study the risk perceptions, disaster responses and long-term viability of coastal communities, such as New York City and New Orleans, to avoid continued devastation from more frequent climate change events. The concentration of wealth and population along the New York City and New Orleans coast has dual implications for successful climate change adaptation because it generates more resources for structural protections but also leads to the distorted perceptions of the actual risk of the accelerated effects of climate change and the ability of the city to recover and withstand repetitive damages which effectively generates a false sense of security for vulnerable residents. In reality there are three frequently cited responses to accelerated climate change which are: protection, accommodation, and retreat or relocation. Relocation by way of choice or force, known as displacement, is recognized by residents, insurance agencies, real estate developers, and policymakers as a more long-term and cost-effective option than the available "in situ"³⁵ adaptation strategies, especially when there are residents that are

³³ Solecki et al., "Urban Climate Change Policy Transitions," 42; Rosenzweig, Cynthia, and William Solecki, "Hurricane Sandy and Adaptation Pathways in New York: Lessons from a First-Responder City," *Global Environmental Change* 28 (2014): 399.

³⁴ O'Neill, Karen M., and Daniel J. Van Albs, *Taking Chances: The Coast After Hurricane Sandy* (New Jersey: Rutgers University Press, 2016).

³⁵ Bukvic and Owen, "Attitudes towards Relocation," 103.

more vulnerable than others. The options quickly become to relocate if displaced or remain as a vulnerable resident and attempt to avoid displacement. The importance of building a resiliency plan and implementing natural disaster mitigation efforts to avoid impending gentrification are now integral in today's urban centers because there have been examples in U.S. history where these plans and efforts were not in place and the cities have fallen victim to natural disasters and the resulting gentrification.

For this reason, there is a strong correlation between climate change resiliency planning and post-natural disaster environmental gentrification.³⁶ The issue consists of the disjunction between the promotion of privatization during post-natural disaster redevelopment and support for public housing in a post-natural disaster urban center. For example, Hurricane Katrina's "shock power" led to the displacement of New Orleans' African-American working class majority as a result of the long-term disinvestment in the public infrastructure, public services and the criminalization of survivors.³⁷ New Orleans public officials and their corporate partners seized on this seemingly clean slate to institute a wide-ranging accumulation by dispossession that opened up new fields for capital accumulation in domains such as public housing communities, which were regarded as off-limits to the calculus of profit making prior to the devastation of Hurricane Katrina.³⁸

³⁶ Seicshnaydre et al., "Rigging the Real Estate Market,"; Arena, John, "Whose City Is It? Hurricane Katrina and the Struggle for New Orleans's Public Housing, 2003-2008," *Driven from New Orleans: How Nonprofits Betray Public Housing and Promote Privatization* (Univ. of Minnesota Press, 2012); Shamsuddin, Shomon, and Lawrence J Vale, "Lease It or Lose It? The Implications of New York's Land Lease Initiative for Public Housing Preservation," *Urban Studies* 54 (2015).

³⁷ Arena, "Whose City Is It?," 182-183.

³⁸ Arena, "Whose City Is It?," 182-183; Sterett, Susan M., "Disaster, Displacement, and Casework: Uncertainty and Assistance after Hurricane Katrina," *Law & Policy* 37 (2015): 65; Buras, Kristen, "Race, Charter Schools, and Conscious Capitalism: On the Spatial Politics of Whiteness as Property (and the Unconscionable Assault on Black New Orleans)," *Harvard Educational Review* 81 (2011), 321.

Correspondingly, New Orleans received money from the moment Hurricane Katrina made landfall which sparked the economic stimulus and process of high-speed privatization. There is episodic assistance post-natural disaster which brings sympathy which then brings new money, specifically in the form of grants and donations, allowing unrestricted money to be allocated wherever the governing officials deem necessary.³⁹ It is possible that local officials believe the public infrastructure is not worth repairing and will award the money to other organizations or corporations they believe will benefit the city more than a public housing project would. The influx of “sympathy money” and the heavy presence of nonprofit organizations fostered an illusion that philanthropic efforts could alone rebuild New Orleans. This illusion provided cover for the New Orleans politicians’ and policymakers’ abandonment of the resident low-income black community and the public housing developments where many of the displaced residents lived and wished to return.⁴⁰

Unfortunately still, more than one decade post-Hurricane Katrina, the availability and accessibility of public housing units is lacking. The importance of preserving public housing as a means of climate change resiliency is critical. Especially in the face of declining federal funding for public housing, local governments and housing authorities need to find alternate sources of revenue to maintain the stock of subsidized housing so that the stage for environmental gentrification is not set in stone.⁴¹ This fight for ever-increasing public housing development opportunities is better developed and supported in the post-Hurricane Katrina New York City.

³⁹ Sterett, “Disaster, Displacement, and Casework,” 65.

⁴⁰ Arena, “Whose City Is It?” 149.

⁴¹ Shamsuddin and Vale, “Lease It or Lose It?”, 141.

In addition to increasing importance of the availability of affordable housing for the growing vulnerability of residents in city centers to climate change, there is also an increasing necessity for proper education, communication and accessibility to reliable flood insurance programs. While it is true that the National Flood Insurance Program (NFIP) provides homeowners the option to purchase federal flood insurance coverages if the home lies within a prohibitive floodplain, the NFIP is limiting in what the coverage covers and how much relief money will be received.⁴² The amount of flood insurance coverage that a property owner is required to purchase is based on the city's Flood Insurance Rate Map (FIRM) which is created by FEMA based on projected flood risk and based on proximity to water.⁴³

Unfortunately in the event of both Hurricanes Katrina and Sandy, both cities' FIRMs had not accounted for climate change planning which meant the severity of both storms with regard to flood risk was largely underestimated. Many of the homeowners in New Orleans were not aware that they were located within a floodplain area due to old and outdated maps that were in use by the mortgage banks and insurance industry.⁴⁴ When Hurricane Katrina caused massive flooding events, these homeowners were left with no flood insurance to cover the loss and those working-class families who did have flood insurance tended to have very little due to the high cost of flood insurance which meant only a handful of homeowners had insurance sufficient to cover a total loss.⁴⁵ In contrast, the recovery process for middle-class homeowners was much swifter with

⁴² Shears, "Hurricane Katrina and New Orleans," 77; Aerts, Jeroen C. J. H., and W. J. Wouter Botzen, *Flood-Resilient Waterfront Development in New York City: Bridging Flood Insurance, Building Codes, and Flood Zoning* (Blackwell Pub. on Behalf of the New York Academy of Sciences, 2011), 26.

⁴³ Aerts and Botzen, *Flood-Resilient Waterfront Development in New York City*, 76.

⁴⁴ Seicshnaydre et al., "Rigging the Real Estate Market," 6.

⁴⁵ *Ibid*, 6.

regard to insurance due to the neighborhood location and flood elevation because these neighborhoods incurred far less flooding. These middle-class residents were more likely to be fully insured and able to recover most of the value of the house from the flood policy. A 2015 report noted that a direct result of the differences in insurance policies among different socioeconomic groups was that 70 percent of long-term white residents were able to return to New Orleans within one year as opposed to just 42 percent of long-term black residents returning.⁴⁶

A similar situation could be observed in New York City post-Hurricane Sandy. Because the standard flood insurance premiums are set by FEMA on the basis of historical losses averaged across the entire U.S.,⁴⁷ losses incurred by flooding in landlocked states, which are substantially less than coastal states like New York, are averaged with historical losses incurred by coastal states which contain the majority of the U.S. population. Therefore, NFIP insurance premiums do not accurately reflect the actual risk faced by policyholders because the premiums do not incorporate climate change or new development at all nor do they properly calculate the actual risk of flooding based on a particular location within the U.S. But in order to provide adequate incentives, such as premium discounts, to policyholders to invest in cost-effective flood-risk reduction cannot be provided through insurance unless premiums actually reflect the realistic risk of exposure to floods.⁴⁸ This policy standard is clearly unjust in coastal cities of which are working to improve climate change resiliency and natural disaster mitigation plans.

⁴⁶ Ibid, 6.

⁴⁷ Aerts and Botzen, *Flood-Resilient Waterfront Development in New York City*, 30.

⁴⁸ Ibid, 41.

However, when FEMA drafted more realistic, updated FIRMs for both New Orleans and New York City, both cities protested the new maps.⁴⁹ In both cities the updated maps showed a greater area of the city to be at higher flood risk which meant that more homeowners would be required to purchase flood insurance. Both cities opposed the drafted FIRMs on the basis that increased flood insurance premiums would decrease property values as well as decreasing the value of the property tax base which would deter new development because incoming revenue would be less likely.⁵⁰ Surprisingly in New York City since Hurricane Sandy the waterfront property values have increased which has resulted in the urgency of waterfront property developers to invest in resiliency projects so that properties can withstand the effects of climate change.⁵¹ It seems as though there are no obstacles standing in between post-Sandy property and the signs of environmental gentrification in New York City while there is an ever-expanding mountain of obstacles working to deny low-income residents access to affordable housing opportunities post-Sandy as there also were post-Hurricane Katrina.

In conclusion, the concept of environmental gentrification is a variant of green gentrification that occurs after a natural disaster and rapidly accelerates the process of traditional urban gentrification. As a result, environmental gentrification magnifies and facilitates further the underlying socioeconomic and environmental inequality already in

⁴⁹ Horowitz, Andy, “New Orleans's New Flood Maps: An Outline for Disaster,” *The New York Times* (2016); Kailath, “New Maps Label Much Of New Orleans Out Of Flood Hazard Area,” *NPR* (2016); “Mayor De Blasio and FEMA Announce Plan to Revise NYC's Flood Maps,” *Emergency Support Function Annexes* (2016); Buckley, Cara, “Twice as Many Structures in FEMA's Redrawn Flood Zone,” *The New York Times* (2013); Dixon, Lloyd, et al., *Flood Insurance in New York City Following Hurricane Sandy* (RAND Corporation, 2013); Dixon, Lloyd, et al., “The Cost and Affordability of Flood Insurance in New York City: Economic Impacts of Rising Premiums and Policy Options for One- to Four-Family Homes,” *RAND Corporation* (2017).

⁵⁰ Horowitz, “New Orleans's New Flood Maps: An Outline for Disaster”; Dixon et al., “The Cost and Affordability of Flood Insurance,” xxi.

⁵¹ Chen, David W., “In New York, Drawing Flood Maps Is a 'Game of Inches',” *The New York Times* (2018).

place at the time of disaster. Two examples of environmental gentrification post-natural disaster are New Orleans in the wake of Hurricane Katrina and New York City in the wake of Hurricane Sandy. The study of these two examples reveals the role of state government decentralization, withdrawal, and privatization in pressuring local governments to actively pursue redevelopment of commercial real estate as ways of bolstering the tax base and generating revenue whilst actively avoiding to reconstruct public housing developments for returning low-income residents.⁵² Environmental gentrification as well as poverty rates have increased in these post-hurricane cities as a result of corporate tourism, citizen neglect and a loss of hope made possible by the lack of collective leadership responding to hurricane survivors' needs and rights to appropriate preparedness, evacuation practices, disaster mitigation and recovery, adequate long-term shelter and affordable flood insurance coverage. The overall objective of combating the effects and continued occurrence of environmental gentrification post-natural disasters is the materialization of a more complete democratic vision of climate change resiliency planning in which the concerns of all potentially affected residents are addressed through transparency, policy, research and thorough presentation of each element throughout the process.

⁵² Jolivette, Andrew, "Displacement, Gentrification and the Politics of Exclusion," *Hurricane Katrina: Response and Responsibilities* (2011): 32.

Chapter 1: Hurricane Katrina Case Study

On August 29, 2005 Hurricane Katrina touched down on the Gulf Coast of the United States, east of New Orleans, Louisiana. The wind speed reached a high of 175 miles per hour and the storm surge peaked at 32 feet as the storm that was generated over the Gulf of Mexico created a hurricane that was quickly understood to be the worst case scenario for the city of New Orleans. The technological and meteorological catastrophe resulted in the death of over 1,800 people, caused flooding and structural damage to 2.5 million homes, and displaced between 700,000 and 1.2 million people.¹ This, in turn, led to the largest forced migration of the American population since the Dust Bowl in the 1930s. The economic damage of Hurricane Katrina was projected to reach \$300 billion which would make it the most costly natural disaster in U.S. history.² Although the damages did not reach \$300 billion, Hurricane Katrina was still considered the most costly natural disaster because the damages reached a staggering \$148 billion.³ In 2006, the Bush administration sought over \$100 billion for repairs and reconstruction on the Gulf Coast. Hurricane Katrina occurred at a time where the 24/7 access to media coverage was available globally and the unsettling images of the damage and destruction of the hurricane touched every corner of the world just as the recent “worst case” events at the time had such as 9/11 terrorist attacks of 2001 and the Asian tsunami of 2004. Hurricane Katrina was a natural disaster that not only essentially destroyed an entire city but also revealed the lack of preparedness and planning that is required for the inevitable increased rate of natural disasters accelerated by climate change.

¹ Erikson, Kai T., *The Sociology of Katrina Perspectives on a Modern Catastrophe* (Rowman & Littlefield Publishers, 2007), 23.

² Ibid, 19.

³ Van Holm, Eric Joseph, and Christopher K Wyczalkowski, “Gentrification in the Wake of a Hurricane: New Orleans after Katrina,” *Urban Studies* (2018): 2; Newman, Andy, “Hurricane Sandy vs. Hurricane Katrina,” *The New York Times* (2012).

Catastrophes like Katrina inflate and magnify the results of poor humanitarian conditions for which a natural event provides a catalyst to invoke widespread human suffering and the results from Hurricane Katrina proved to be no different. New Orleans hosts a massive resident population of socioeconomically disadvantaged people. The long and varied history of New Orleans as resulted in alarming oppression. Africans first came to the city as slaves, people without rights and owned by others as property. After emancipation, former slaves and their descendants in New Orleans remained members of an underclass, relegated to segregated neighborhoods lacking city services. When the affluent white residents fled the city in the mid-twentieth century for the suburbs, this underclass of poor black residents was left behind in a decaying metropolis. In the 2000 Census, 67.8 percent of the New Orleans population self-identified as African American.⁴ Even 135 years after emancipation, New Orleans was the second most racially segregated city in the U.S. and nearly 30 percent of the city's total population lived below the poverty level pre-Katrina.⁵

It is important to note that, beyond segregation, the racial geography of New Orleans pre-Katrina was influenced by elevation. The predominantly white, "old-line" families had been in the city for generations and lived in old houses that forever occupied the "highest land".⁶ The relatively sparsely occupied areas on low ground were areas forgotten by civic improvement initiatives and the least protected by levee systems and mostly occupied by minority populations including African Americans, Asians, and Hispanics.⁷ Prior to Hurricane Katrina concentrations of poverty were most prominent in minority neighborhoods and black and white residents were living quite literally in different worlds. 43 percent of African Americans in New Orleans lived

⁴ Shears, Andrew B., "Hurricane Katrina and New Orleans: Discursive Spaces of Safety and Resulting Environmental Injustice," *Kent State University* (2011): 85.

⁵ *Ibid*, 32.

⁶ *Ibid*, 98.

⁷ *Ibid*, 99-100.

in poverty compared to the only 11 percent of white residents.⁸ The Lower Ninth Ward is a prime example of the discrepancy of wealth and population in New Orleans. The Lower Ninth Ward was the city's most impoverished area with a population of over 98 percent African American and the average household income below \$27,500 in 2000 which was less than half of the national average at the time.⁹ One quarter of the households in the Lower Ninth Ward earned less than \$10,000.¹⁰ This neighborhood was vulnerable not only because of its proximity near poorly constructed levees, but because 32 percent of residents lacked access to automobile transportation¹¹, ultimately trapping the residents directly in the path of the looming hurricane. Many of the city's poorest residents knew nothing, beyond unreliable word-of-mouth sources, of the approaching hurricane because they lacked access to media such as television, radio or internet and they could not even rely on the newspaper because as much as 40 percent of the neighborhood was functionally illiterate.¹²

The location and landscape of New Orleans is important to highlight because it has always played a role in the city's history and on goings. The original city of New Orleans was nicknamed the "Crescent City" because of its location fully within a curve of the Mississippi River, however, it has since spread out to include a significant area covering 180.56 square miles of land.¹³ Most importantly, majority of the city lies well below sea level inspiring the nickname: the Bathtub. The physical landscape of New Orleans had been changed remarkably during the nearly 300 years of the city's existence. Notably, the man-made protective levees,

⁸ Ibid, 108.

⁹ Ibid, 108.

¹⁰ Ibid, 108.

¹¹ Ibid, 108.

¹² Ibid, 111.

¹³ Ibid, 85.

constructed by the Mississippi River Commission between 1882 and 1972¹⁴ and reinforced by the U.S. Army Corps of Engineers (USACE) between 1993 and 1999,¹⁵ the Mississippi River to heights as tall as 25 feet about its normal surface and lining both banks along the river's entire path through the city.¹⁶ The levees' collective strength was overestimated even though the levees built by the Mississippi River Commission were built with a tremendous margin of error above the highest recorded flood levels but the levees were subject to subsidence, just as the city itself was, and the levees were never reinforced prior to Hurricane Katrina.¹⁷ As sea level rises, Louisiana's land is subsiding, a process that is consequently accelerated by the levee system because it prevents mud from the Mississippi River from replenishing the subsiding land.¹⁸ There were also canals, such as the Industrial Canal, carved throughout New Orleans to drain water out of the city as well as to bring water into the city as a means of transportation.¹⁹

The Industrial Canal, officially called the Inner Harbor Navigation Channel and Lock,²⁰ was the first major canal project aimed at improving New Orleans' accessibility to shipping traffic. The canal was completed in 1923 and upon completion the canal connected Lake Pontchartrain to the Mississippi River which resulted in land opening up along the canal to industrial development and drawing industrial development north of the river along the canal's western bank.²¹ The Industrial Canal created an opportunity for separation from the poorer Lower Ninth Ward and New Orleans East sections of the city while opening up exposure and access to new sections of the city. A result of the proximity and connection of the Industrial

¹⁴ Rogers, J. David, "Historical Background on the New Orleans Levee System," *Natural Hazards Mitigation Institute at University of Missouri-Rolla*.

¹⁵ Nelson, Stephen A., "Hurricane Katrina - What Happened?" *Tulane University* (2007): 48.

¹⁶ Shears, "Hurricane Katrina and New Orleans," 89.

¹⁷ *Ibid*, 90.

¹⁸ Horowitz, Andy, "New Orleans's New Flood Maps: An Outline for Disaster," *The New York Times* (2016).

¹⁹ Shears, "Hurricane Katrina and New Orleans," 91.

²⁰ *Ibid*, 66.

²¹ *Ibid*, 66.

Canal and Lake Pontchartrain was that the canal was subject to the same tidal surges of water driven by hurricanes and in 1947 the Industrial Canal experienced its first flooding event from a hurricane that resulted in floods in only parts of the city along the canal.²² As a result of this flooding event the USACE proposed a plan in 1960 for moveable gates at the Lake Pontchartrain end of the Industrial Canal to act as additional support against future flooding and in 1964 this project was completed just in time for Hurricane Betsy in 1965.²³ Hurricane Betsy resulted in floods on both sides of the Industrial Canal proving, yet again, the miscalculation and misjudgement by the USACE. However, in 1990 the U.S. Water Resources Development Act gave the USACE sole responsibility for hurricane protection on the Industrial Canal, a responsibility previously held by the historical Orleans Levee district, after the Levee District lobbyists successfully have this language inserted into the bill because the District could no longer fund the large-scale maintenance the protection efforts then required.²⁴ The USACE reinforced the existing levees along the Industrial Canal, built by the Mississippi River Commission, as well as constructed floodwalls along drainage canals off of the canal, to act as further hurricane protection, between 1993 and 1999.²⁵ In 2005 the USACE was still in the process of constructing several bridges over the Industrial Canal and multiple drainage canals²⁶ so the effectiveness of the levees and floodwalls was compromised at the time that Hurricane Katrina struck New Orleans in late October of 2005. Unfortunately the power behind the storm surge velocity and wind speeds of Hurricane Katrina proved too much for the floodwalls and levee systems which were evidently doomed from the point of construction due to lack of due

²² Nelson, "Hurricane Katrina - What Happened?", 47.

²³ Ibid, 47.

²⁴ Ibid, 48.

²⁵ Ibid, 48.

²⁶ Ibid, 48.

diligence in the form of routine structural and reinforcement practices by the USACE, Mississippi River Commission, Louisiana state officials, and New Orleans city officials.

Though the city was officially governed by land-use approaches in concert with the participation in the National Flood Insurance Program (NFIP) beginning in 1968, implementation of these guidelines were impossible in a city that lies mostly within a prohibitive floodplain.²⁷ The NFIP, officially established by Congress in 1968, enables homeowners to purchase insurance coverage against flood damage under “certain conditions” that most commercial insurance companies “refuse” to cover in standard insurance policies such as “direct material damage” caused by floods, flood-related erosion “as a result of waves or currents of water, and mudslides”.²⁸ However, risks to infrastructure, life, and agriculture are “outside the scope of the NFIP”²⁹ which leaves the NFIP to cover only damages to residential buildings and nonresidential buildings such as shops and businesses. This is where the trade-off between the NFIP and private insurance coverage conflicts because homeowners are faced to choose between protection of real estate alone (covered by NFIP) or the contents within that real estate alone (covered by private insurance). The structural mitigation, the levees and sediment deposition, that was supposed to be protecting New Orleans pre-Katrina was lacking, even with the partial failure of land-use strategies as mitigation for flooding. The levees funded by the Flood Control Act in 1965 were finished but designed to insufficient standards. The damage brought on by the failure of the levees was bound to occur due to New Orleans’ unfortunate landscape and location with regard to sea level.

²⁷ Shears, “Hurricane Katrina and New Orleans,” 77.

²⁸ Aerts, Jeroen C. J. H., and W. J. Wouter Botzen, *Flood-Resilient Waterfront Development in New York City: Bridging Flood Insurance, Building Codes, and Flood Zoning*, (Blackwell Pub. on Behalf of the New York Academy of Sciences, 2011), 26.

²⁹ *Ibid*, 26.

As the destruction initiated by Hurricane Katrina continued to ravage residents of New Orleans for more than a week, it became clear to residents and outsiders alike that this was not just an average hurricane but a catastrophic disaster. The man-made levees breached and floodwaters inundated 80 percent of the city which made clear the colossal failure of engineering and human technology with the collapse of the levee system. In addition to the massive flooding destruction, Hurricane Katrina also resulted in massive amounts of contamination when water mixed with oil, pesticides, fertilizers and other hazardous and toxic waste materials.³⁰ The contaminated flood waters made their way and settled in the regions of the city with the lowest elevation, Saint Bernard Parish, the Lower Ninth Ward, and the Lakeview area, which coincidentally happened to be the most impoverished areas of New Orleans.

New Orleans is still recovering from the catastrophic impacts of Hurricane Katrina and, quite possibly, will never fully recover. The destruction from Katrina in Louisiana alone cost insurance companies \$14.5 billion in claims during the first year after the storm and claims still to be processed in the years following.³¹ In the New Orleans metropolitan area, all sectors of “non-formal” employment have experienced decline and the return of manufacturing had not occurred within a year after Hurricane Katrina.³² More seriously, construction employment, and therefore production, had not rebounded in the entire Mississippi Gulf Coast in the year following Katrina which greatly hinders any progress of reconstruction, reflecting an anomalous pattern following a natural disaster.

There was also, and still is, the lingering uncertainty throughout Louisiana about the displacement and relocation of the hundreds of thousands of residents who were forced to evacuate the city. Displaced residents essentially had three options for use of their relief funds or

³⁰ Erikson, *The Sociology of Katrina Perspectives on a Modern Catastrophe*, 23-24.

³¹ Ibid, 27.

³² Ibid, 27.

insurance money: return and rebuild in New Orleans, leave New Orleans but rebuild somewhere else in the state, or rebuild in some other state. Due to the necessity of displaced residents to reestablish residential, social, economic and personal security in a timely fashion it was most advantageous to former residents to leave New Orleans. However, their departure only hindered recovery in the metropolitan area in terms of failing to reestablish the pre-Katrina population, economy, and culture of New Orleans in a timely fashion. Community recovery also requires the establishment of a vast range of resources for returning residents. Population return is a step in the right direction that not only involves the movement of people but also the reestablishment of physical, cultural, economic, familial, interpersonal, and personal resources. In other words, in addition to physical capital, social and cultural capital must also be created for a sense of community to emerge, or re-emerge.

The prospects for “reconstruction” and “ultimate community recovery” in New Orleans seemed unlikely in the years following Hurricane Katrina. By 2008 the New Orleans metropolitan area only had 41 percent of the jobs that existed before Katrina.³³ Throughout the Gulf Coast, 278,000 workers were displaced, and a year later 100,000 households still remained in FEMA trailers which were later found to be contaminated with formaldehyde gas.^{34, 35} Furthermore, only 60 percent of the pre-Katrina population in New Orleans had returned by 2008, resulting in a maximum population of 279,000 residents which was a 40 percent reduction in the pre-Katrina population.³⁶ The simple fact that between 150,000 and 160,000 homes and apartment complexes were labeled or designated “destroyed” or “damaged beyond repair” indicated that restoration was not going to be achieved in a timely fashion. These designations

³³ Ibid, 28.

³⁴ Ibid, 28.

³⁵ Sterett, Susan M., “Disaster, Displacement, and Casework: Uncertainty and Assistance after Hurricane Katrina,” *Law & Policy* (2015): 67.

³⁶ Erikson, *The Sociology of Katrina Perspectives on a Modern Catastrophe*, 28.

subsequently hinder reconstruction efforts for homeowners and renters because relief funding for reconstruction and/or relocation is deliberated upon, and often denied, for years to come. In 2006, the capacity of New Orleans's public services and local community infrastructure was at less than 50 percent of pre-Katrina capacity. This included gas and electrical services that were slow to reestablish service to residences and businesses and less than one-third of all public schools were operating twelve months after Katrina.³⁷

Similarly, medical care, educational services, public transportation, and other critical infrastructure capacities that had not been restored created an unavoidable but predictable social framework that manifested the collective trauma amongst survivors into corrosive social processes for residents. As predicted by sociologists, psychologists, and anthropologists the crime rate rapidly rose, including homicides and post-Katrina domestic violence, which in turn became a significant deterrent to returning residents. Furthermore, insurance companies proposed a 31.7 percent increase in premiums for residential dwellings and approximately a 140 percent increase for commercial establishments.³⁸ The drastic rate increases served as yet another impediment for the return of former residents.

The residents of the communities devastated by Hurricane Katrina witnessed three major failures by human-led institutions: the failure to prepare, the failure to respond, and the failure to rebuild. When communities are devastated by a natural disaster, residents do not have the ability to decide what is destroyed but they do have the ability decide what is reconstructed. Natural disasters the destroy the physical landscape of an area also weaken local residents' and outsiders' perspectives of place. As a landscape is shaped by human intervention, the perceptions about that place are also shaped and with an abrupt change in the topography, a forced change in the

³⁷ Ibid, 28.

³⁸ Ibid, 28.

perception of the landscape takes place, causing a new and unfamiliar outlook on the once familiar land. The rebuilding of specific elements in a disaster-stricken community emphasizes the important social and political ideals a society values and wishes to transmit to the next generation. During Hurricane Katrina, the collapse of such social institutions, as mentioned, led to a setting in which the residents choosing to remain in New Orleans fostered feelings of stress, uncertainty and distrust as well as a loss of social capital. The magnification of the underlying social dynamics, including wealth and race discrepancies, within disaster-affected communities creates a sociocultural landscape that could either be improved or left to fester into a “corrosive community.”³⁹ A corrosive community is defined as the result of the combination of a natural disaster and a technological disaster that does not reflect appropriate and timely recovery and rehabilitation so the impacted community, or communities, enter a cycle of secondary social conflicts and chronic psycho-social impacts.⁴⁰

The vision of the landscape remaining post-Katrina was one of re-establishment and redevelopment. Hurricane Katrina destroyed lives and neighborhoods by forcing a majority of the contributors to the city’s culture into a diaspora. In the sociocultural landscape of New Orleans, the city experienced high levels of unemployment and poverty before the storm, contributing to large economic station gaps between rich and poor residents. In the economy post-Katrina New Orleans is showing an even greater widening gap between the rich and poor. This trend increased more since some of the temporarily displaced population is returned to the city in an attempt to gain or regain employment but it is unlikely that the trending wealth gap is going to narrow in the near future.

³⁹ Ibid, 28.

⁴⁰ Ibid, 28.

New Orleans, pre-Hurricane Katrina, was already a host of a series of social crises. The city developed economically because of its convenient location near the mouth of the Mississippi River, but that very location came with environmental threats that mostly made investment prohibitively risky. From the beginning, various government entities subsidized the risk of this location through the construction of expensive infrastructural mitigation projects, such as levees, and the funding of other ineffective land management programs, such as the NFIP. With these structures, the balance of risk was shifted enough to create a capitalist space in which investment was less prohibitive. Simultaneously, with a transitioning economy, this environmentally dangerous location became the host a vast population of socioeconomically disadvantaged people. Policies encouraging suburbanization resulted in the “ghettoization”⁴¹ of the poor, and segregation of the races, leaving an inner-city population that was predominantly African American and less affluent. New Orleans was the site of a humanitarian crisis at the time of Hurricane Katrina’s landfall: disadvantaged people living in a dangerous environment. The state had, shamefully, done nothing but encourage this situation through slow and static planning and mitigation.

Ultimately Hurricane Katrina had an outcome that was unforeseen by those who it would affect the most. This outcome was blindly encouraged by those who wished to see New Orleans prosper economically once again but who failed to understand the damage the outcome would do to the rich historical culture of the city. This outcome is environmental gentrification. While a Katrina-like event was predicted by physical scientists and its outcomes anticipated by social scientists, many of the outcomes, whether seen as consequences or benefits, were amplified to a much greater extent than could have been predicted. There are several factors that followed Hurricane Katrina that provided the ingredients to a perfect recipe for environmental

⁴¹ Shears, “Hurricane Katrina and New Orleans,” 112.

gentrification in New Orleans. First, the three failures that the residents and survivors of Hurricane Katrina witnessed: failure to prepare, failure to respond, and failure to rebuild. These three failures created an unjust and unstable environment in which residents did not have adequate information or resources to even consider the possibility of returning to life as they knew it. The second factor contributing to the environmental gentrification of New Orleans was the reconstruction efforts, or lack thereof, in many parts of the city but most notably in the historically underprivileged areas and the public housing neighborhoods. The third contributing factor or series of factors was the lack of planning and preparedness by government sectors on all levels from federal to local officials. The meager politicians and policymakers that pose to be the “experts” to the people whom are governed failed in planning for a major natural disaster in the years, months, days, and hours leading to hurricane touchdown. Similarly, the federally funded insurance companies, of which work closely with government officials, misused the time and resources of residents and volunteers arguably for the political gain of politicians. Many of the homeowners in New Orleans were not aware that they were located within a floodplain area due to old and outdated maps that were in use by the mortgage banks and insurance industry.⁴² When Hurricane Katrina caused massive flooding events, these homeowners were left with no flood insurance to cover the loss and those working-class families who did have flood insurance tended to have very little due to the high cost of flood insurance which meant only a handful of homeowners had insurance sufficient to cover a total loss.⁴³ In contrast, the recovery process for middle-class homeowners was much swifter with regard to insurance due to the neighborhood location and flood elevation because these neighborhoods incurred far less flooding. These middle-class residents were more likely to be fully insured and able to recover most of the value

⁴² Seicshnaydre, Stacy, et al., “Rigging the Real Estate Market: Segregation, Inequality, and Disaster Risk,” *The Data Center* (2018): 6.

⁴³ *Ibid*, 6.

of the house from the flood policy. A 2015 report noted that a direct result of the differences in insurance policies among different socioeconomic groups was that 70 percent of long-term white residents were able to return to New Orleans within one year as opposed to just 42 percent of long-term black residents returning.⁴⁴ Another contributing factor to the environmental gentrification of post-Katrina New Orleans was the immense displacement caused by damage to homes. The displacement, due to lack of housing, that followed Hurricane Katrina affected public housing accommodations and opportunities for those who needed it the most yet no attention was paid to these victims or public housing reconstruction efforts at all.

First, to understand the factors leading up to and contributing to environmental gentrification in New Orleans after the occurrence of Hurricane Katrina it is important to understand the events and factors chronologically. Environmental gentrification is unique in that it is a type of gentrification that appears to occur at a faster rate than traditional urban gentrification in that it is brought on by the occurrence of a natural disaster and change is rapid and sudden. However there has to be groundwork in place for the city undergoing environmental gentrification that sets the foundation for dissatisfaction with the current system. In the case of Hurricane Katrina this dissatisfaction of minority residents was rooted in and accelerated by the constant failure of public entities to fulfill basic requirements such as proper preparedness for catastrophic events including Hurricane Katrina. The consequences of a potentially dangerous and destructive hurricane in the New Orleans area was predicted by engineers, emergency management specialists, climate change specialists, meteorologists, sociologists and other scientists but the results of the predictions were not taken seriously by politicians and policy makers. Reports made by these various scientists and planners point the blame for the widespread panic, death and destruction caused by Katrina at these politicians and policy makers

⁴⁴ Ibid, 6.

for failing to act on the predictions of physical and social scientists. The failure to act accordingly and responsibly revealed this: the inevitable, almost manufactured, failure that resulted in an inept and ineffective response effort by all levels of the government from federal to local.

While finding, identifying, and allocating authority during a hurricane is an obvious challenge in a time of chaos there should be allocations and plans in place ahead of a natural disaster, nevertheless, an impending and highly anticipated hurricane. In the case of Hurricane Katrina the complexity of authority in disasters centers on the relationship among political jurisdictions and the understanding that current political officials have of that relationship. Historically in the U.S., responsibility for solving disaster response issues is located at the local level. If the demands are too great for the local governing body, the responsibility to assist is assumed to involve the state. If the state resources are not sufficient, the federal government is expected to provide the necessary resources and aid. However, there are certain events that do not respect this organized chain of command, such as a terrorist attack, in which case the federal government is predicted to immediately necessary. This creates the expectation that federal resources will be made immediately available for use by the local and state officials.

With the anticipation of the Hurricane Katrina touchdown there was an obvious disconnect between all of the various government actors. Local officials anticipated the assistance and resource availability of FEMA immediately while FEMA officials seemed confident in the local officials and their resources so FEMA officials did not appear to be concerned. To make it worse, FEMA director Michael Brown, who was subsequently fired from this position immediately following his failure to prepare and respond adequately post-Katrina, only made his first request for Homeland Security rescue workers to be deployed to the disaster

area after only two days of rescue training. It was clear and transparent that government officials who were tasked and trusted by the residents of New Orleans to plan properly and protect residents from ultimate catastrophe, instead the government officials on all levels, federal, state, and local, heightened the widespread panic and instability that lead up to and continued throughout the aftermath of Hurricane Katrina. The collective panic and instability held by the residents of New Orleans were feelings that festered and eventually embedded themselves in the minds and lives of all survivors of Hurricane Katrina which lead to a cooperative insecurity and uncertainty about the future of New Orleans especially amongst those who fled the city during or before evacuation.

Immediately following the touchdown of Hurricane Katrina in late August of 2005, it was obvious that there was yet another failure by public entities to provide proper, balanced, and proportionate response and relief to all residents of New Orleans. There was widespread belief and agreement among the African American surviving residents that the government's response to the hurricane would have been faster if the majority of victims were white instead of black.⁴⁵ On the contrary, white residents and survivors of the hurricane believed, when prompted with the same question, that the race of the storm victims did not make a difference in the government's response time or efforts.⁴⁶ Not surprisingly there was widespread agreement amongst all races that the perception of income played a role in rescue response being that the higher class residents received a more accommodating response than that of middle- and low-class residents.⁴⁷ Race and class contributed tremendously to the federal response to Hurricane Katrina and the actions taken following the hurricane to rescue endangered and at-risk residents

⁴⁵ Ibid, 105.

⁴⁶ Ibid, 105.

⁴⁷ Ibid, 105.

and help them attain pre-storm status.⁴⁸ It is now understood by social scientists that the inordinate suffering experienced by socioeconomically disadvantaged groups post-Katrina can be directly attributed to the racist and classist history of New Orleans. This history is thought amongst minority residents to have affected the decisions of historically racist and classist politicians, officials, and permanent residents. An unceremonious result of the constant media coverage tracking the response efforts following the hurricane was the focus of news broadcasting showing primarily black residents stranded in New Orleans. At the time of Hurricane Katrina, of the fifteen U.S. metropolitan areas with the most African American residents, New Orleans had the highest African American poverty rate which was 33 percent.⁴⁹ Within the urban center of the city, the poorest residents resided in the areas with the lowest elevation which are the areas most vulnerable to flooding,⁵⁰ all thanks again to the the Bathtub nickname for New Orleans. Whether or not questions of race and class are included in the argument of the failure to respond sufficiently, it is understood and evident that the survivors of Hurricane Katrina were failed tremendously by the public services of the city that are in place and expected to provide the bare necessities in times of crisis.

As time progressed following the August 2005 occurrence of Hurricane Katrina efforts to rebuild New Orleans were less than satisfactory and the residents were faced with the third failure of public service entities: failure to rebuild. It became apparent to impoverished residents of New Orleans that the city was in no rush to rebuild the disadvantaged areas of the city. Most notably the USACE recommended that large sections of the flooded areas not be rebuilt because of the potential flooding from future storms and this instruction from the trusted organization

⁴⁸ Shears, "Hurricane Katrina and New Orleans," 14.

⁴⁹ Barnshaw, John, and Joseph Trainor, "Race, Class, and Capital amidst the Hurricane Katrina Diaspora," *The Sociology of Katrina: Perspectives on a Modern Catastrophe* (2007): 99.

⁵⁰ Horton, Hayward Derrick, et al., "After the Storm: Race and Victim's Reactions to the Hurricane Katrina Aftermath," *Reinventing Race, Reinventing Racism* (Haymarket Books, 2012), 106.

was followed promptly.⁵¹ Although New Orleans's public housing and projects, which were and still are a major resource of low-rent housing the city's impoverished residents, were in poor condition pre-Katrina, there was a considerable pressure not to replace or repair damaged and destroyed units but to instead redevelop those projects located in potentially upscale neighborhoods for entirely different uses and users. Louisiana Congressman Richard Baker is quoted saying, "We finally cleaned up public housing in New Orleans. We couldn't do it, but God did it," just a short time after the hurricane.⁵²

Perhaps the most prominent indication of the desire to revitalize, or gentrify, post-Katrina New Orleans made by politicians and policymakers was the very public and very overt decision to destroy several public housing units throughout the city, even if the structures had incurred little to no damage from the hurricane. Prior to Hurricane Katrina there was a plan in place by the city of New Orleans to relocate 5,000 units of public housing to "more ideal" locations for multi-family homes and these ideal locations were inevitably further from downtown New Orleans city centers and further from tourists.⁵³ Surprisingly the city decided to continue with the pre-Katrina plans for demolition of these homes.⁵⁴ These demolitions and some unfinished mixed-income housing rebuilding plans dramatically shifted the Housing Authority of New Orleans's portfolio toward vouchers subsidizing tenants in neighborhoods farther from the city center.⁵⁵ What this meant for New Orleans residents who were living in affordable housing units prior to Hurricane Sandy is that the subsidies they were receiving, if any, for hurricane damages would drastically decrease and anyone who had a chance of moving back into affordable housing

⁵¹ Van Holm and Wyczalkowski, "Gentrification," 2.

⁵² Marable, Manning, and Kristen Clarke, *Seeking Higher Ground: the Hurricane Katrina Crisis, Race, and Public Policy Reader* (Palgrave Macmillan, 2008), 279.

⁵³ Seicshnaydre et al., "Rigging the Real Estate Market: Segregation, Inequality, and Disaster Risk", 5.

⁵⁴ Ibid, 6.

⁵⁵ Ibid, 6.

units after Katrina would be relocated to the less-desirable Lower Ninth Ward neighborhood. Prior to Katrina, the Lower Ninth Ward had a high home ownership rate because many residents lived in houses that their families had owned for many generations but because the homes had been paid off, there was no requirement of insurance. If a house was damaged or destroyed during the hurricane, which the majority of homes in this neighborhood were, there was less likelihood of insurance money or subsidies and less chance of reconstruction. This resulted in the neighborhood giving an impression of desolation rather than recovery which made it easy for city officials to cluster the majority of the remaining affordable housing units to this area. By 2010, 7,500 affordable housing homes were mostly clustered together in and around the Lower Ninth Ward⁵⁶ and only about 28 percent of the pre-Katrina population had returned.⁵⁷ By 2018, 8,800 affordable housing units were located in the same neighborhood⁵⁸ which continued to be a segregated and high-poverty area; maintaining the pattern of systematic segregation throughout New Orleans.

Questions arose about the destruction of public housing units with regard to the lack of damage that was existent in the buildings: “Replacement of these buildings with contemporary construction would yield buildings of lower quality and shorter lifetime duration, the original construction methods and materials of these projects are far superior in their resistance to hurricane conditions than typical of new construction”⁵⁹ as demonstrated in the absence of neither complete destruction nor reconstruction post-Hurricane Katrina. It was clear that the vision of post-Katrina New Orleans did not include fair, equal, and public housing opportunities. The challenge of the public officials and private enterprise seemed clear to everyone except the

⁵⁶ Seicshnaydre et al., “Rigging the Real Estate Market,” 6.

⁵⁷ Adelson, Jeff, “After Hurricane Katrina, a Look at New Orleans' Uneven Recovery among Its Neighborhoods,” *The Advocate* (2015).

⁵⁸ Seicshnaydre et al., “Rigging the Real Estate Market,” 6.

⁵⁹ Marable and Clarke, *Seeking Higher Ground*, 279.

public officials and private enterprise and it was to restore housing, health care, schools, jobs, and commercial establishments in concert with one another as quickly and effectively as possible in order to maintain the city's character and culture once again. However, the politicians and policymakers may have seen it differently and while those actors were dithering, "modern-day carpetbaggers"⁶⁰ closed in on the opportunity for environmental gentrification. Speculators and opportunists, such as real estate developers and multinational corporations, began buying up property near the Industrial Canal across from the Lower Ninth Ward at bargain prices, and creating an influx of money that was supposed to indicate that the city's economy would begin to drive forward and upward.

Following Hurricane Katrina it became clear that the patterns of harm and destruction are directly influenced by the deliberate choices of policymakers and politicians and the risks associated with natural disaster events are exacerbated as the local economic "elites" and policymakers long for the privileged expansion of economic growth that they are willing to worsen the flood risks for city residents.⁶¹ There was a discernible anti-effort to rebuild affordable housing units swiftly as resources to rebuild made themselves available post-Katrina. There was a certain corporate cultural appropriation⁶² taking place in New Orleans. This appropriation was spearheaded, once again, by politicians and policymakers failing to provide an egalitarian opportunity for reconstruction in terms of both wealth and class.

In other words, where there was reconstruction there was wealth and where there is wealth there is classism. In the city's failure to maintain critical public services, including the infrastructure, officials long knew the protective levees surrounding the city were inadequate,

⁶⁰ Marable and Clarke, *Seeking Higher Ground*, 281.

⁶¹ Van Holm and Wyczalkowski, "Gentrification," 12.

⁶² Jolivet, Andrew, "Displacement, Gentrification and the Politics of Exclusion," *Hurricane Katrina: Response and Responsibilities* (2011): 32.

leaving it vulnerable to precisely the destruction that occurred during Hurricane Katrina. New Orleans, similar to virtually all metropolitan cities in the U.S., experienced and still experiences many costs of racism, concentrated poverty, and uneven development. These forces, though, have had the ability to shape or hinder the redevelopment efforts in and around New Orleans and other cities seeking paths to prosperity for their residents.⁶³ However, inequalities associated with socially constructed markers are not always a direct result of a natural disaster occurrence. Such inequalities reflect the conscious choices made by political and economic decision-makers and implemented by public and private institutions that exacerbate inequalities. Different choices were available in the post-Katrina New Orleans and the opportunity to implement change that could have reversed the integrated inequalities were present but those choices were not taken advantage of by such decision-makers and institutions. Instead opportunists quietly coaxed policymakers, politicians, and insurance representatives into environmentally gentrifying the “new New Orleans.”⁶⁴

This pattern is still evident today in New Orleans because there is a broader valuation of central city, or downtown, real estate so the culture of the central city neighborhoods has been transformed, successfully some might say, as these communities come to reflect their wealthier, often white, residents.⁶⁵ For example, a town that has been a focus of environmental gentrification studies, Bywater, provides a clear picture of this shift in neighborhood composition nearly a decade after Katrina.⁶⁶ Before Hurricane Katrina, Bywater was a working-class neighborhood with six out of every ten of its residents identified as black.⁶⁷ However, after Katrina the composition of the neighborhood changed. By 2015, 56 percent of all Bywater

⁶³ Marable and Clarke, *Seeking Higher Ground*, 279.

⁶⁴ Marable and Clarke, *Seeking Higher Ground*, 286.

⁶⁵ Van Holm and Wyczalkowski, “Gentrification,” 4.

⁶⁶ Adelson, Jeff, “After Hurricane Katrina”.

⁶⁷ *Ibid.*

residents were white and the overall annual household income had increased by a 17 percent rise in earnings overall.⁶⁸ Bywater became increasingly characterized by residents who had moved to the New Orleans area after the storm and, consequently, had undergone and continues to undergo the process of environmental gentrification.

The demographic patterns in New Orleans have been described as a white teapot,⁶⁹ with its kettle surrounding the universities and uptown and its spout following the curves of the river along the Garden District; Central Business District, also known as “central city”; French Quarter and into Faubourg Marigny. The teapot is a majority-white area meaning its residents tend to be white and also wealthier than the rest of the city. In the post-Katrina New Orleans the pot has appeared to have grown bigger with an expanding kettle and a spout that now stretches through the converted shotgun houses of an environmentally gentrified Bywater across the Industrial Canal into the Holy Cross section of the Lower Ninth Ward. The key to the speed of these areas’ recovery can be attributed to the lack of damage that was incurred in such areas. These areas most quickly regained large portions of their populations by the time of the 2010 census⁷⁰ and they now represent most of the areas at full occupancy. The new occupants of these areas are characterized as the “financially empowered demographic” which includes white, wealthy, and young people.⁷¹ Those characteristics, in terms of demographics, are echoed throughout the highly populated areas of New Orleans post-Hurricane Katrina. By mid-year 2006, just one year after Hurricane Katrina, the New Orleans’ population was older, more educated, and less poor, with fewer renters and fewer households with children.⁷² Similarly, five

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Ibid.

⁷¹ Ibid.

⁷² Fussell, Elizabeth, “The Long-Term Recovery of New Orleans’ Population After Hurricane Katrina,” *American Behavioral Scientist* (2015): 1239.

years after Hurricane Katrina, in 2010 non-Hispanic Whites,⁷³ higher income households, adults aged 40 and older, and native “Louisianans” relocated closer, often within the metropolitan city center areas, while “non-Hispanic African Americans”, lower income households, younger adults aged 25 to 39 years,⁷⁴ and “non-native Louisianans” tended to move further away and even out of state. Furthermore, “non-African American”⁷⁵ and college-educated residents returned sooner; with over half returning within the first four months after Hurricane Katrina, as compared to African Americans and residents without a college degree, of who only half had returned by five years.⁷⁶ While this is a result of the racial segregation that is embedded in the history and culture of New Orleans it is also a clear indicator that New Orleans is undergoing environmental gentrification.

Housing and rehousing, either temporary or permanent, are critical issues for family life, access to jobs, schools and other community facilities, and household finances. The extent of destruction caused by Hurricane Katrina of both privately-owned as well as public and assisted housing was undeniably large; over 300,000 housing units were labeled “seriously damaged or destroyed” which was 73 percent of all units.⁷⁷ The government, federal, state and local, largely mishandled efforts at relocation and replacement housing, encouraging local public housing authorities to give admission priority to evacuees over people on the waiting lists in neighboring areas, effectively pitting one needy group against another and proving yet again the incompetence of government officials in times of crisis.⁷⁸ While incumbent residents of New Orleans were still living in temporary apartments or FEMA trailers in December 2006, the U.S.

⁷³ Ibid, 1239.

⁷⁴ Ibid, 1239.

⁷⁵ Ibid, 1239-1240.

⁷⁶ Ibid, 1240.

⁷⁷ Marable and Clarke, *Seeking Higher Ground*, 276.

⁷⁸ Ibid, 276.

Department of Housing and Urban Development (HUD) made the executive decision to demolish more than 4,500 public housing apartments which was a decision characterized as “the most prominent skirmish in the larger battle over the post-Katrina balance of whites and blacks in New Orleans” and how decisions on rebuilding shape the city’s demographic future.⁷⁹ By 2010 and again in 2018 low-income black residents are not gaining housing choice and opportunity in the post-Katrina New Orleans.⁸⁰ There is a clear indication of the priorities and motivations of city officials to effectively attempt to diminish the African American population from the city.

As the process of reconstruction was underway and progress began to appear; as the city of New Orleans was being reborn and rebranded, questions arose amongst policymakers and city officials with regard to how to balance continued reconstruction efforts while increasing the influx of money. In 2009, only four years after Hurricane Katrina, drafts of new Flood Insurance Rate Maps (FIRM) for the city of New Orleans were released by FEMA and showed that majority of the city was still vulnerable to flooding.⁸¹ City officials protested the 2009 FIRM drafts because the flood maps had the potential to shape the city’s future by dictating property values, insurance premiums, and perceptions of the city’s vulnerability on the basis that FEMA had not adequately taken into account the protection offered by the new \$14.5 billion post-Katrina levee system.⁸²

More than six years later, in early 2016, FEMA released the finalized FIRMs for New Orleans⁸³ and it appeared that overnight more than half of the New Orleans population had

⁷⁹ Ibid, 279.

⁸⁰ Seicshnaydre et al., “Rigging the Real Estate Market,” 6.

⁸¹ Horowitz, “New Orleans's New Flood Maps”.

⁸² Ibid.

⁸³ Ibid.

moved out of the high-risk flood zone.⁸⁴ This dramatic remodel of the flood maps for the city meant that those more than half of the New Orleans population that were no longer living in the high-risk flood zone would no longer be required to buy flood insurance and this was the exact outcome that city officials were hoping for. A result of properties not being at high-risk is lower insurance rates which makes property more affordable and therefore encourages development. The new maps were described as a “bureaucratic magic trick...Statistically...For insurance purposes”⁸⁵ to do away with the actual inevitable flooding that is predicted to occur as effects of climate change result in bigger and more frequent severe weather events. But also Louisiana faces the highest rate of sea-level rise of any coastal region in the world because of the unique land subsidence that is occurring as well as its particularly low elevation with regard to sea level.⁸⁶ According to 2016 projections, about 75 percent of New Orleans will be below sea level by 2050⁸⁷ but according to the 2016 FIRMs, the majority of the city is safe anyways. Policymakers and city officials were seemingly ill-advised or turning a blind eye to these facts, in 2016 the director of safety and permits in New Orleans, Jared Munster, said about the new maps: ““That is absolutely a great victory, and it represents to us [New Orleans’ residents] that the federal government is very comfortable in our level of protection.””⁸⁸ Nevertheless when New Orleans floods again, which it will, thousands of residents and homeowners will incur worse results than those of Hurricane Katrina because when their houses flood they will not have flood insurance as indicated by the flood maps of which city officials are calling a “great victory.”

⁸⁴ Ibid.

⁸⁵ Kailath, Ryan, “New Maps Label Much Of New Orleans Out Of Flood Hazard Area,” *NPR* (2016).

⁸⁶ Horowitz, “New Orleans's New Flood Maps”.

⁸⁷ Horowitz, “New Orleans's New Flood Maps”.

⁸⁸ Kailath, “New Maps”.

However, even though city officials said the 2016 maps were a great victory, New Orleans residents were still encouraged to keep, even purchase, flood insurance. Munster said: “People need to understand that just because a piece of paper says you’re going to be safe, that does not mean that you are going to be safe.”⁸⁹ But even with this statement New Orleans residents were not inclined to purchase flood insurance because the flood maps told them they were not required to and, as a result of less homeowners purchasing insurance, the city would continue be desirable for development because property would be cheaper.

There was and still is the incentive to increase the tax base, so municipalities within New Orleans seek to create amenities for new residents by changing the character of housing or otherwise transforming neighborhoods from their past conditions to an upgraded state so as to more likely appeal to residents of a higher socioeconomic status. Local and outside developers alike sought to make an opportunity of the destruction caused by Katrina by monopolizing the planning and reconstruction processes. It is now known that neighborhoods with a higher percentage of physical building damage from Hurricane Katrina were more likely to be gentrified one decade after the storm because the costs of rebuilding did not deter developers seeking the economic opportunity.⁹⁰ City officials were accused by affordable housing activists of seeking to mold the “cityscape in a fashion more amenable to the accumulation of capital.”⁹¹

This trend of systematically molding the outcome of post-Katrina reconstruction can be identified in other policy areas such as the public education system and the emergency response system. The public school system post-Katrina is thought to have been an experimental plan that was consciously envisioned and enacted by a host of policymakers and city officials including but not limited to nationally influential conservative foundations, such as the Center on

⁸⁹ Kailath, “New Maps”.

⁹⁰ Van Holm and Wyczalkowski, “Gentrification,” 12.

⁹¹ Ibid, 4.

Reinventing Public Education and the Heritage Foundation, federal authorities, Louisiana lawmakers, state education officials, local politicians, business leaders and educational entrepreneurs.⁹² These elite policymaking actors contributed to the trend by fostering exclusionary decision making to capitalize on the public institutions upon which all communities within New Orleans depend. New Orleans experienced a rapid introduction of market-based reforms to the affordable housing system, the public education system, as well as emergency first-response protocols.⁹³ These changes indicate that there is a broader trend that is transforming the city of New Orleans visibly and culturally. A result of the greater capacity, on average, of white residents to recover post-Katrina is that the city's racial composition has shifted⁹⁴ and the impact of this shift in racial composition has impacted the public input in the policy-making process by creating an unequal distribution of interest groups. As new construction and reconstruction began to accelerate in the post-Katrina New Orleans it was clear that those "speculators and opportunists" who wanted to see the city rebuilt wanted it to be done in a completely different way demographically, geographically, and politically thus accelerating the process of environmental gentrification.

If Hurricane Katrina had a positive outcome at all it would be a proper example of a classic natural disaster event that had significant physical, economic and social short- and long-term impacts. Hurricane Katrina exposed not just the shortcomings of planning for the immediacy following an emergency in New Orleans, but also the lack of foresight and commitment to protecting residents once recovery has commenced. Displacement of at-risk, low-class and impoverished, typically black, residents of areas affected by natural disasters is

⁹² Buras, Kristen, "Race, Charter Schools, and Conscious Capitalism: On the Spatial Politics of Whiteness as Property (and the Unconscionable Assault on Black New Orleans)," *Harvard Educational Review* (2011): 322.

⁹³ Shears, "Hurricane Katrina and New Orleans," 172-175.

⁹⁴ Van Holm and Wyczalkowski, "Gentrification," 4; Adelson, "After Hurricane Katrina"; Horton et al., "After the Storm," 122.

arguably the largest concern with regard to local economy and culture. Recovery of affected areas requires significant political choices prior to and after the occurrence of the event.

It is hard to say definitively whether environmental gentrification is all beneficial or all detrimental to the urban center that is undergoing the process post-natural disaster occurrence. While it is important to re-establish a growing economy and increase real estate development, it is also, arguably more, important to accommodate the basic needs of all residents not just the residents who can afford to keep up with growing costs. Although New Orleans had a history of racial segregation and classist tendencies, that history is not indicative of who thrives and who barely survives a natural disaster and its aftermath. The principle guiding planning efforts should not be focused on subservience to the desires of the high-class white population in a metropolitan area while actively ignoring the lowest-class residents and pretending as though that population never existed prior to the natural disaster. The process of planning efforts to combat maximum damage incurred by impending natural disasters in a city should provide true democratic participation of all residents and citizens affected by the disaster and unbiased distribution of costs and benefits. Above all, Hurricane Katrina provided an opportunity to examine and reevaluate the national and political connection between disaster planning and relief and race and class to better understand how inequality has been imprinted spatially, economically, and socially into U.S. metropolitan areas and how the now obvious consequence of environmental gentrification can be subsequently anticipated and avoided in the wake of other natural disaster occurrences in cities worldwide.

Chapter 2: Hurricane Sandy Case Study

New York City is subject to a pattern that has proven to be historically successful which is widespread and huge development along coastal land just as many other cities around the world and within the U.S., including New Orleans, have developed as well. These coastal developments are located at, near, or below sea level which makes the coastal urban areas vulnerable to natural disasters including storm surges, shoreline erosion, and tsunamis. Traditionally something that has not been included in urban city center planning is the acceptance and anticipation of climate change and its subsequent effects on coastal areas. It is known that by the end of this century, increased rates of sea-level rise accelerated by climate change could cause permanent inundation of portions of low-lying coastal cities, repeated flooding events, and severe coastline erosion.¹ The anticipated sea-level rise has challenged policymakers and city planners to adapt to and mitigate these adverse effects of climate change. However, the rate at which said adaptation and planning efforts in New York City has been less than necessary.

The greater New York City Metropolitan East Coast area encompasses an area of 33,670 square kilometers and 22 million residents of which around 8 million reside in Manhattan.² New York City contains over 2,000 kilometers of shoreline and the city's development has historically been closely linked to water access which has resulted in the construction of over 2,000 bridges and tunnels³ that connect the island with the mainland. As of 2007, high-density commercial and residential development has been rapidly replacing abandoned factories and piers along the

¹ Jacob, Klaus, et al., "Vulnerability of the New York City Metropolitan Area to Coastal Hazards, Including Sea-Level Rise: Inferences for Urban Coastal Risk Management and Adaptation Policies", *Managing Coastal Vulnerability* (2007): 141.

² Ibid, 141-142.

³ Ibid, 142.

waterfront in metropolitan New York as the city slowly transitions from an industrial to services economy.⁴ The shift in building usage alone is indicative of the city's rapid switch from a manufacturing to a service industry-based economy and city. As early as 2007 plans for redevelopment have been underway to mold some of New York City's most historic areas into new, attractive neighborhoods;⁵ such as the World Trade Center site in Lower Manhattan and Brooklyn's former Naval Shipyards. Brooklyn and Long Island, located south of New York City, have long been tourist destinations for city-dwellers looking to escape the urban landscape so beaches and coastal wetlands provide recreational opportunities for urban populations but also act as critical habitat of wildlife. However, the pressure cultivates as coastal development increases rapidly as do the coastal hazards.

New York City has an extensive and colorful history of natural disasters. New York City has continuously been affected by "extra-tropical cyclones ('nor'easters')"⁶ that occur largely between late November and March and less frequently by "tropical cyclones ('hurricanes')"⁶ that occur between late July and October. Storm tracking and maps have continued to be constructed throughout the city's history and the maps prove what is expected based on varying severity of storms: the larger the storm, the greater impact it has on the city. The highest destructive potential of hurricanes in New York City was traditionally and historically calculated to be a combination of the effects of high winds that occur at speeds over 120 kilometers per hour, heavy rainfall, and coastal flooding due to storm surge and waves.⁷ It was traditionally understood that although the wind speeds of nor'easters were typically lower than those of hurricanes, the potential damage is significant because the duration of such storms is longer than

⁴ Ibid, 142.

⁵ Ibid, 142.

⁶ Ibid, 143.

⁷ Ibid, 143.

that of hurricanes. This inequality in potential damage is due to the longer storm surge duration during nor'easters allowing flooding to flow farther inland and, consequently, cover a broader areal extent.⁸ Although these data were the traditional predictions of storms based on history, they did not account for the flooding due to coastal storms accelerated and becoming more commonplace as a result of rising sea-level due to climate change.

Flooding during hurricanes and nor'easters is an obvious hazard for New York City and the severity and frequency of hurricanes will only increase as the effects of climate change continue to affect weather patterns. Flood height is determined by storm surge characteristics, timing, and relative sea-level rise. The hurricane history of New York City, from 1788 until 2012, has proved that flood height is continuously increasing with storm surge characteristics and timing of astronomical tides remaining the dominant factors in determining flood height.⁹ Notably, one of the most destructive and powerful hurricanes in recorded history struck Long Island, New York City, and Southern New England in September of 1938 and is known as the Great New England Hurricane of 1938.¹⁰ In New York City, the flood height reached a maximum of over eight feet but the floodwaters rose seven feet in less than 30 minutes¹¹ causing widespread panic and virtually no time for preparation in the city. The category 3 Great New England Hurricane caused almost 200 deaths in total, ten of which were in New York City; caused millions of dollars in infrastructure damage; caused power outages in all of the Bronx, Manhattan, and the subway system; and destroyed over 100 trees in Central Park.¹² Luckily in 1938, although the hurricane caused major damage in New York City, the eye of the hurricane

⁸ Ibid, 144.

⁹ Kemp, Andrew C., and Benjamin P. Horton, "Contribution of Relative Sea-Level Rise to Historical Hurricane Flooding in New York City," *Journal of Quaternary Science* (2013): 537.

¹⁰ US Department of Commerce, and NOAA, "The Great New England Hurricane of 1938," *National Weather Service* (2018).

¹¹ Ibid.

¹² "A History of Major Storms in NYC", *NBC New York* (2012).

was not close to New York City so the city only experienced the weaker side of the hurricane,¹³ which could have caused far more damage if it has passed closer to the five boroughs of New York City. However only one hurricane, prior to Hurricane Sandy, was believed to have passed directly over parts of modern New York City in 1821 when waters rose 13 feet in only one hour but the damage was less than severe due to the far less number of properties than there are today.¹⁴ While the damage incurred on the city by hurricanes in the past has been destructive, the routine occurrences of hurricanes has allowed for severe weather preparedness plans and policies in place.

Historically in New York City there have been several agencies responsible for the planning, mitigation and response of natural disaster occurrence, including the National Weather Service (NWS), New York State Emergency Management agency, New York City Office of Emergency Management, the Federal Emergency Management Agency (FEMA), FEMA's National Flood Insurance Program (NFIP), and the U.S. Army Corps of Engineers (USACE). Prior to Hurricane Sandy in 2012 there was an organized progression of power in place in the event of a natural disaster event in New York City. The NWS would routinely track storms and their progression by satellite and issue warnings accordingly which would then alert state and city agencies to assess the situation at a local level,¹⁵ meaning the agencies would decide whether or not to declare a storm emergency and, if necessary, issue an evacuation low-lying areas and beaches via prescribed evacuation routes to emergency shelters. Perhaps these routine planning and order of authority can be attributed to mistakes made among various emergency response agencies before, during, and after Hurricane Katrina. However, similar to the response to Hurricane Katrina, FEMA would still be responsible for providing financial aid for

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Jacob et al., "Vulnerability of the New York City Metropolitan Area," 150.

reconstruction effort alongside the NFIP which endorses flood insurance to communities that adopt measures to reduce future flood risks in hazardous areas.¹⁶ To review, the NFIP enables homeowners to purchase insurance coverage against flood damage only under certain conditions that most commercial insurance companies refuse to cover in standard insurance policies.¹⁷ However, risks to infrastructure, life, and agriculture are outside the scope of the NFIP¹⁸ which leaves the NFIP to cover only damages to residential buildings and nonresidential buildings such as shops and businesses. This trade-off between the NFIP and private insurance coverage causes homeowners to choose between protection of real estate alone (covered by NFIP) or the contents within that real estate alone (covered by private insurance).

The next step in New York City's traditional disaster planning agenda, based on FEMA and NFIP flood mapping and zoning, the USACE is to build and manage dams and levees to minimize flood damage, exactly as instructed of the agency in New Orleans prior to Hurricane Katrina, as well as undertaking beach nourishment and tidal marsh restoration projects surrounding New York City.¹⁹ It is important to note that the USACE have always factored sea-level rise into coastal mitigation plans but only based on historic sea-level rise predictions rather than accelerated sea-level rise based on climate change.

However, despite the relatively organized preparedness of New York City and its associated disaster-planning agencies, there has always been a pressure present on local authorities brought on by the hope of new development and greater economic growth for the city. The pressure of continuous urban development coupled with the fragmentation of jurisdictions

¹⁶ Ibid, 150.

¹⁷ Aerts, Jeroen C. J. H., and W. J. Wouter Botzen, *Flood-Resilient Waterfront Development in New York City: Bridging Flood Insurance, Building Codes, and Flood Zoning* (Blackwell Pub. on Behalf of the New York Academy of Sciences, 2011), 26.

¹⁸ Ibid, 26.

¹⁹ Jacob et al., "Vulnerability of the New York City Metropolitan Area," 151.

among federal, state and local governments and inter-agency shortcomings has hindered the development of a cohesive regional coastal management and disaster mitigation plan in New York City. Early projections of sea-level rise predicted sea level to rise between 0.24 and 1.08 meters by the year 2100 which seemed unlikely and worst-case scenario in 2007 at the time of prediction.²⁰ It was, however, widely understood that current and future assets of New York City and surrounding areas needed to remain secure and the city needed to maintain its reputation as a safe and attractive global center for commerce, trade, culture, education and diplomacy so it was necessary to implement a long-term plan for coastal risk management, planning, and mitigation. Early recommendations for a city-wide climate action plan included: evacuation planning; prohibiting or limiting waterfront development; organizing a state-governor-appointed task force to ensure cohesiveness between jurisdictions; conducting benefit-cost analyses to predict and plan for economic losses; and lastly, establishing sustainability measures or practices within the city to educate the public.²¹

Depending on how those recommendations are viewed and by whom, policymakers and city officials decided to focus on urban sustainability which was arguably the least effective²² method of natural disaster and climate change planning. The rapid state-sponsored sustainable urban development, a practice often referred to as “greening”, was well-intentioned. The hope was to create a more resilient landscape by creating new green spaces throughout the city that would act as buffers for properties in the event of a natural disaster occurrence while simultaneously preparing the city for the inevitable sea-level rise. However, the idea and concept of this sustainable development was quickly amplified by rapid development in general,

²⁰ Ibid, 145.

²¹ Ibid, 156.

²² Checker, Melissa, “Wiped Out by the ‘Greenwave’: Environmental Gentrification and the Paradoxical Politics of Urban Sustainability,” *City & Society* (2011): 222.

not completely green, using the guise of the idea of sustainability to sell the development ideas to the public and city officials. It was quickly understood that it was acceptable by the city that a new luxury housing development could be constructed if there was a promise of a public park or some form of green amenity associated with the construction. The private developers, and city officials supporting the private developers, acted as so-called “environmental rights activists” and their development efforts were advertised to be only motivated by the desire to improve New York City neighborhoods by removing environmental burdens, such as previously abandoned or damaged buildings, and installing environmental benefits,²³ such as small parks or even just a water fountain next to massive luxury apartment buildings or high-end businesses. However these efforts quickly transformed into the priming of these neighborhoods, seemingly just undergoing green upgrades, to attract an influx of affluent new residents²⁴ thus commencing the early stages of environmental gentrification. This so-called “green gentrification”²⁵ is masked with the language of sustainability and the promise of long-term benefits such as disaster mitigation, disaster buffering, and accessibility to sustainable amenities. In urban history the establishment of green amenities are advertised to benefit low-income residents because they offer the promise of open accessibility and mutual benefits for all residents, regardless of socioeconomic status. In reality, urban green initiatives result in the displacement of all other residents that cannot afford the associated expensive amenities. This signals the practice of elitism moving into such gentrifying neighborhoods.

It was made clear through increasing rent and property prices during early efforts of “greening” New York City in the early 2000’s that low- and middle-class residents were required

²³ Ibid, 212.

²⁴ Ibid, 212.

²⁵ Gould, Kenneth A., and Tammy L. Lewis, *Green Gentrification: Urban Sustainability and the Struggle for Environmental Justice* (Routledge Taylor & Francis Group, 2017), 23.

to create and maintain resiliency to avoid neighborhoods gentrifying. The two key resources that contributed to resiliency to gentrification, prior to Hurricane Sandy, were rent stabilization and home ownership.²⁶ Residents, prior to Hurricane Sandy, were under the impression that these were the two most reliable solutions to avoid green gentrification as a result of state-sponsored sustainable urban development because it was understood that those rent-controlled homes as well as owner-occupied homes would be included in disaster planning based on former New York City mayor Bloomberg's PlaNYC climate action plan.

PlaNYC 2030 was Mayor Bloomberg's action on climate change for New York City, released in April 2007,²⁷ and its associated long-term sustainability plan. The plan boasted practices which would accelerate change to climate-related initiatives and sector-level action efforts and focused on many different aspects of city operation and function. It called for the creation of a climate change adaptation task force, the development of adaptation plans and the need to consider highly vulnerable communities in New York City.²⁸ In August 2008 the New York City Climate Change Adaptation Task Force was created which was a group made up of representatives from the city's Departments of Environmental Protection, Planning, Public Health, and Transportation, as well as state and regional transportation agencies.²⁹ The primary focus and goal of the task force was to determine what steps could or should be taken to ensure the continued function of the city's critical infrastructure,³⁰ such as roads, subways, communication services, energy, water, and public parks and open space, in the event of a natural disaster or as climate change effects became more apparent. Mayor Bloomberg also

²⁶ Pearsall, Hamil, "Moving out or Moving in? Resilience to Environmental Gentrification in New York City," *Local Environment* (2012): 1024.

²⁷ Solecki, William, et al., "Urban Climate Change Policy Transitions," *The Adaptive Challenge of Climate Change* (2015): 41.

²⁸ *Ibid*, 46.

²⁹ *Ibid*, 47.

³⁰ *Ibid*, 47.

established the New York City Panel on Climate Change (NPCC)³¹ which was made up of academic and research experts and was established to advise the Climate Change Adaptation Task Force on the development of adaptation strategies to secure the city's infrastructure from the effects of climate change. City officials as well as Bloomberg himself were particularly interested in understanding how the frequency and intensity of heat waves, extreme wind events, inland and street-level flooding, and coastal flooding and storm surge would change, potentially increase, over time with climate change.³²

Between 2010 and 2011 Mayor Bloomberg again shifted the focus of the New York City's policy approach to climate action planning by way of mainstreaming climate adaptation into everyday climate risk practice and management and turning the focus onto the concept of climate resilience and opportunities for broader societal resilience.³³ Resilience was defined as increased preparedness for future climate changes; improved communication of climate impacts at the community level; fortification of critical infrastructure, including buildings and coastlines; and opportunities to enhance existing resources with emerging climate change information.³⁴ While the resiliency planning looked attractive on paper, it too promoted green gentrification through state-sponsored greening initiatives attempting to enact Bloomberg's goal of overall citywide resiliency so the stage was set for the continued implementation and execution of environmental gentrification in the event of a natural disaster such as Hurricane Sandy in 2012.

Hurricane Sandy made landfall on October 29, 2012 and it was credited with being the largest storm ever recorded in the Atlantic Ocean reaching more than 1,000 miles in diameter³⁵

³¹ Ibid, 47.

³² Ibid, 47.

³³ Ibid, 48.

³⁴ Ibid, 48.

³⁵ Manuel, John, "The Long Road to Recovery: Environmental Health Impacts of Hurricane Sandy," *Environmental Health Perspectives* (2013): A153.

and affecting all states on the East Coast from Maine to Florida. Officially Sandy was labeled “post-tropical cyclone” but unofficially it was referred to in media outlets, official documents, and press releases as “superstorm” and “hurricane.”³⁶ The estimated cost of damage from Hurricane Sandy was totaled at \$71 billion in New York State alone, including \$9 million for preventative work.³⁷ While some insured losses are still being negotiated the sum thus far has reached somewhere between \$16 billion and \$22 billion.³⁸ In New York alone, over 305,000 housing units were damaged or destroyed and left a total of 8.51 billion homes without power in 16 states³⁹ including Washington, D.C. Only 10 days after Sandy made landfall there were already 465,000 FEMA assistance applications filed⁴⁰ in New York and New Jersey combined. Unlike Hurricane Katrina, which caught leaders at all levels of authority unprepared, the well-established wide net of government agencies in place in New York City was equipped to handle the health and security threats posed by Hurricane Sandy. The National Guard deployed 200 troops to keep order⁴¹ in New York City; FEMA sent Incident Management Assistance Teams to coordinate federal resources to support states affected; and the U.S. Coast Guard positioned teams along the entire East Coast shoreline to carry out search and rescue missions. Mayor Bloomberg proactively ordered the evacuation of some high-risk coastal areas in New York City as well as the closure of bridges and tunnels throughout the city, along with subway lines, commuter trains, bus lines, and the three major airports.⁴² Also immediately following the touchdown of Sandy additional federal agencies deployed assistance: the U.S. Department of Health and Human Services deployed over 500 personnel, including Disaster Medical Assistance

³⁶ Newman, Andy, “Hurricane Sandy vs. Hurricane Katrina,” *The New York Times* (2012).

³⁷ *Ibid.*

³⁸ *Ibid.*

³⁹ *Ibid.*

⁴⁰ *Ibid.*

⁴¹ Manuel, “The Long Road to Recovery,” A153.

⁴² *Ibid.*, A153-A154.

Teams; the American Red Cross opened shelters in 13 states; FEMA established Disaster Recovery Centers across Connecticut, New York, and New Jersey so survivors could apply for assistance and seek information on alternative housing; and within 24 hours FEMA supplied more than one million liters of water and more than a million meals⁴³ to the New York National Guard and to volunteers to distribute to survivors.

Dangers to public health, such as the threat of airborne mold, prompted questions with regard to the trade-off between saving homes that, many, were beyond repair and risking the health of victims and volunteers alike. As volunteer work essentially halted collectively, homeowners, as well as city officials, who were faced with the daunting task of repair with no experience or assistance also began to question if relief efforts were worth the time and effort; especially if climate change meant more frequent and severe storms would cause even more death and destruction than Sandy. A result of the thousands of New York City residents faced with the uncertainty of repair or migration from New York City was the 2012 decision of New York Governor Cuomo to request that the state allocates \$400 million to buy out homes damaged beyond repair by Sandy, demolish these homes, and restore the land as undeveloped coastline.⁴⁴ Cuomo hoped to prepare for the imminent threat of more intense storms courtesy of climate change. By relocating residents away from the dangerous coastline and restoring the land to a buffer for floodwaters New York City could have potentially saved lives and money but have to force residents from their very homes that still had a chance of being repaired. While Cuomo's proposal did become a bill, it was not surprisingly rejected by state and federal officials whose rationale for rejection reflected homeowners' motivation to rebuild their damaged homes. However, many private developers used the same logic as Cuomo as a proposition to convince

⁴³ Ibid, A154.

⁴⁴ Ibid, A158.

displaced homeowners to make a profit off of the damaged homes in an attempt to ““make everybody happy””⁴⁵ because homeowners would have started a fund to buy a new home with money received from the purchase of their damaged home and developers would have obtained cheap real estate on the highly sought-after New York City coastline for a fraction of what it would have cost prior to Hurricane Sandy. These transactions between victims and private developers effectively accelerated the process of environmental gentrification post-natural disaster.

The proposal by real estate developers to displaced residents of selling their damaged or destroyed homes became a common solution among middle- and upper-class residents who could afford to relocate but it was not a realistic solution for lower-middle class and low-class New York City residents. A result of New York City’s location being a coastal urban center is that increasing population growth and density and the proliferation of economic activities as well as the geopolitical significance⁴⁶ of the city puts more people and assets at risk.

While it is understood that natural disasters do not discriminate based on socioeconomic status, it is also understood that natural disasters significantly affect the more vulnerable population no matter where that disaster occurs. In New York City, Hurricane Sandy magnified the environmental inequality occurring as well as inequality in climate change planning based on socioeconomic status. Mayor Bloomberg’s PlaNYC efforts aimed to create governance structures and practices to promote flexible and transformative climate action and resiliency plans. But there was still the question of how to promote increased resilience to extreme climate events while actively avoiding the exacerbation of common urban stressors such as population growth, pollution, increased resource demands, and concentrated poverty in New York City.

⁴⁵ Ibid, A158.

⁴⁶ Bukvic, Anamaria, and Graham Owen, “Attitudes towards Relocation Following Hurricane Sandy: Should We Stay or Should We Go?” *Disasters* (2016): 102.

These urban stressors were not clearly taken into account in Bloomberg's PlaNYC. In the years following Hurricane Sandy, climate change obviously was increasingly affecting municipal decision-making frames altering local conceptions of cities as vehicles for economic growth, political change, livelihoods and basic needs, as well as for larger-scale goals of resilience and sustainability.⁴⁷ The prospect of economic growth in New York City is far too valuable and attractive to ambitious private real estate developers and investment companies to walk away in the face of destruction post-natural disaster.

In the years following Hurricane Sandy there was an expected decline in housing stock as well as the housing market. Not only did Sandy impact the local housing market negatively in terms of quality and availability, an unexpected consequence on the housing market was that the impact was combined with other characteristics that affected areas already had such as socioeconomic inequality, homelessness, and lack of affordable housing.⁴⁸ However there was a gradual increase the momentum of the real estate market in Manhattan and Brooklyn as real estate that was located close to the urban core of each area was quickly and quietly bought out by private developers. Neighborhoods in Manhattan where the access to downtowns, as opposed to remote from downtown, was easier than other neighborhoods have experienced and continue to experience the steady inflation of the housing markets because of the expected future value from the gentrification occurring as a result of the damage from Sandy.⁴⁹ The housing crisis post-Sandy has shown property value increasing but availability is decreasing. This has had negative impacts on lower-income and minority occupied neighborhoods because the stagnation of the

⁴⁷ Solecki, William, "Hurricane Sandy in New York, Extreme Climate Events and the Urbanization of Climate Change: Perspectives in the Context of Sub-Saharan African Cities," *Current Opinion in Environmental Sustainability* (2015): 93.

⁴⁸ Chun, Yung, "Gentrification of Neighborhoods in New York City after Hurricane Sandy: Focusing on Housing Market Change of Three Borough Region by Zip Code Area," *Columbia University* (2015): 28.

⁴⁹ *Ibid*, 28-29.

housing market in the remote⁵⁰ neighborhoods that are located away from downtowns has caused a reduction in economic activity of that neighborhood as well as increases in unemployment rates and declines in income and wealth for these lower-income and minority residents. It is clear that the effect of the housing market crisis on these residents has made life more difficult for economically vulnerable households. A result of the areas in proximity to the downtowns of Manhattan and Brooklyn is the increase of economic activity post-Sandy which has a positive impact on business and employment so policymakers and government officials were satisfied but effectively failed to address the fundamental housing problems occurring outside of the downtowns such as the lack of housing affordability, increasing household budgets, fluctuating housing market changes of local markets post-Sandy and the overall lack of affordable housing units.

Opposition towards the preservation of low-income and affordable housing is not a new phenomenon as seen in the reconstruction efforts, or lack thereof, post-Hurricane Katrina. Subsidized housing is viewed as an obstacle to growth because rents are capped, which runs counter to the goal of seeking higher real estate exchange values.⁵¹ The preservation of subsidized and affordable housing is also seen as a barrier to development because it hinders the intensification, or construction, of the land which is essential to obtaining higher rents. After Hurricane Sandy local officials in New York City “hand[ed] over”⁵² land and tax breaks to private investors and developers in hopes that development would generate revenue from property taxes. These investors and developers then used clever ideology and discourse, such as offering amenities to all residents, to convince these officials and residents that the development

⁵⁰ Ibid, 28.

⁵¹ Shamsuddin, Shomon, and Lawrence J Vale, “Lease It or Lose It? The Implications of New York’s Land Lease Initiative for Public Housing Preservation,” *Urban Studies* (2015): 139.

⁵² Ibid, 139.

will result in additional growth in the local economy and overall property value and ultimately benefit everyone. In reality the processes of differential land investment, meaning differed ideas of how land will be used and allocated, coupled with political influence leave little room for uses with low economic value, in the form of affordable housing, which is often at the expense of low-income residents.⁵³ The exchange value that is actually demonstrated by local governments and private developers in New York City is the dismantling of public housing projects that were subtly or severely damaged by Sandy that were previously 100 percent low-income and building a mix of market-rate and affordable housing options, with fewer benefits and far less availability for low-income residents. This process essentially becomes “state-sponsored gentrification”⁵⁴ as hundreds of public housing buildings were demolished post-Sandy and tens of thousands of low-income families were displaced from their homes and entire neighborhoods were transformed.

The question remains in New York City how, and whether, it is possible to simultaneously encourage economic development and preserve housing for low-income affordable housing in the same place while also planning and encouraging resiliency in the face of increasing climate change effects. New York City is littered with construction sites and has been since Sandy touched down in 2012 and these construction sites are producing buildings that are double and triple the height of the neighboring buildings in Williamsburg and the Gowanus Canal area. Apartment buildings appear to be on building-growth hormones as skyscrapers and taller buildings are transforming the New York City skyline. In Tribeca, 11 neighborhood buildings have been demolished between 2012 and 2015 with 19 more outdated buildings eventually meeting their fate in the coming decade.⁵⁵ Six of these 11 buildings were purchased by a private investment firm for \$50 million, at \$1,000 per square foot, and is anticipated to

⁵³ Ibid, 139.

⁵⁴ Ibid, 140.

⁵⁵ Sorkin, Michael. “Another City,” *The Nation* (2015).

require apartments selling at a minimum of \$3,000 per square foot to turn a profit.⁵⁶ But the loss of these buildings eliminated 120 rent-stabilized apartments and 40 small business.⁵⁷ This pattern is being echoed throughout the five boroughs of New York City. Neighborhoods are undergoing the process of environmental gentrification because the residual value of a neighborhood's historic character sanctions successor forms creating an attractive and ideal breeding ground to exploit its low-price real estate and aggregate its prestige.

The affordable housing and housing affordability crises are a main concern and priority of current New York City mayor Bill de Blasio's OneNYC plan for equality and resilience among all residents of New York City. A major component of de Blasio's plan is his proposal "Housing New York: Zoning for Quality and Affordability"⁵⁸ which calls for the replacement of planning by zoning as a characteristic of the negotiation between public and private interests for urban-development policy. De Blasio's proposal attempts to create cooperation between private, mostly luxury, business development and affordable, accessible public housing development. This plan hoped to create a bridge between public and private interest groups so as to reach a compromise for the vision of future development in New York City. Within New York City there is a process of ownership and the process operates as the right to transform property in terms of its use, size, performance, and appearance through negotiation, technological and social evolution, corruption, reconceptualization, and now destruction.⁵⁹ The affordable housing crisis in New York City is more urgent than ever thanks to existing affordable housing locations' widespread deterioration, mediocre design, poor community integration, and location of a large number of projects still located in flood zones. The Hurricane Sandy damages on various

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Ibid.

affordable housing locations and its aftermath on the housing market and privatization of redevelopment has brought these urgent issues back into the foreground.

The official statement released by FEMA in 2013 with regard to progress in improvements towards affordable insurance policies on the one-year anniversary of the landfall of Hurricane Sandy was that New York City can improve its resilience and speed its recovery by taking steps to mitigate the risk of flood damage and to increase flood insurance coverage for its residents and businesses.⁶⁰ With New York City's 520 mile long coastline, there are more residents living in high-risk flood zones than any other city in the U.S.⁶¹ and threats posed by impending future climate change events are becoming more persistent so there is an obvious demand for more affordable insurance policies as well as flood zoning. In 2018 FEMA finally announced plans to redraw New York City's flood maps for the first time in 30 years⁶² which will affect tens, even hundreds, of thousands of residents and wildly alter how and where new buildings can be constructed and the associated cost of flood insurance. New York City is the first major metropolis to be remapped with the consideration of the realities of climate change such as rising sea levels and increasingly powerful storms.⁶³ With the implementation of these new maps if older buildings end up the new high-risk flood zones, owners will be required to buy flood insurance or make expensive modifications that will most likely be beyond the reach of many working-class and low-income residents and homeowners.⁶⁴

Before beginning to analyze the many possible outcomes and implications of changing flood maps and zones in New York City, understanding the ever-changing dynamic nature of

⁶⁰ Dixon, Lloyd, et al., *Flood Insurance in New York City Following Hurricane Sandy* (RAND Corporation, 2013).
xx.

⁶¹ Chen, David W., "In New York, Drawing Flood Maps Is a 'Game of Inches'," *The New York Times* (2018).

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Ibid.

flood zone mapping throughout the city's history is necessary. The NFIP sets insurance premiums and minimum building standards based on FEMA guidelines for special flood hazard areas. These set standards to achieve risk reduction by imposing minimum requirements for local governments' flood zoning and flood building codes as well as providing incentives to homeowners to invest in risk reduction beyond minimum standards.⁶⁵ The NFIP is generally considered to have been successful in providing flood insurance to many households in the U.S. to which flood insurance would otherwise be inaccessible, but the program has been ineffective in limiting new developments in high-risk areas, much like the New York City coastline, and in reducing the vulnerability of existing buildings to flood hazards. This is typically attributed to the absence of climate change or other future developments, such as urban development, in the NFIP. In addition to climate change having an impact on future flood risks, population and economic growth in already hazard-prone areas such as New York City, which has experienced exponential population growth over the past decade, are like to have a major impact as well.⁶⁶

Prior to Hurricane Sandy the NFIP insured a value of about \$8 billion in New York City alone⁶⁷ and the NFIP was attractive to homeowners because it enabled the purchase of insurance coverage against flood damage that most commercial insurance companies did not cover in standard insurance policies. However, the NFIP had its limitations some of which included: limitation of type of flooding; coverage price cap for residential properties; and the requirement of homeowners to have NFIP coverage in order to qualify to receive any type of federal financial assistance, including federal disaster assistance even if the damage is not flood-related.⁶⁸ The standard flood insurance premiums are set by FEMA on the basis of historical losses averaged

⁶⁵ Aerts and Botzen, *Flood-Resilient Waterfront Development in New York City*, 2.

⁶⁶ *Ibid*, 9.

⁶⁷ *Ibid*, 26.

⁶⁸ *Ibid*, 28.

across the entire U.S.⁶⁹ which means that losses incurred by flooding in landlocked states, which are substantially less than coastal states like New York, are averaged with historical losses incurred by coastal states which contain the majority of the U.S. population. Therefore, NFIP insurance premiums do not accurately reflect the actual risk faced by policyholders because the premiums do not incorporate climate change or new development at all nor do they properly calculate the actual risk of flooding based on a particular location within the U.S. But in order to provide adequate incentives, such as premium discounts, to policyholders to invest in cost-effective flood-risk reduction cannot be provided through insurance unless premiums actually reflect the realistic risk of exposure to floods.⁷⁰ In 2011 the issues that were proposed for improvement of the NFIP included the need to improve the accuracy of the Flood Insurance Rate Maps (FIRM), released by FEMA, create FEMA mitigation grants that are suitable as a climate change adaptation tool, set risk-based insurance premiums, and pay more attention to vital infrastructure.⁷¹ When these improvements were compared to the challenges that New York City faced in 2011 the most prominent challenge was how to develop the New York City waterfront such that it enhances flood protection levels by applying measures that also improve environmental values.⁷² However that solution was not found with enough time to become effective before Hurricane Sandy made its mark on the city.

One year after Hurricane Sandy made landfall FEMA released new federal flood maps, or FIRMs, that were already in the process of being updated when the hurricane struck and accelerated their release date.⁷³ The new proposed FIRMs effectively doubled the number of properties and structures located areas labeled as high-risk flood zones meaning about 35,000

⁶⁹ Ibid, 30.

⁷⁰ Ibid, 41.

⁷¹ Ibid, 68-69.

⁷² Ibid, 69.

⁷³ Buckley, Cara, "Twice as Many Structures in FEMA's Redrawn Flood Zone," *The New York Times* (2013).

more homes and businesses found themselves in flood zones⁷⁴ which, as demonstrated in the post-Katrina New Orleans FIRMs, will likely increase insurance rates drastically as it would now be required by all of those homes to purchase flood insurance. It was understood by New York City residents that they had only two choices: “pay now [in 2013] to rebuild smarter, or pay higher insurance rates later.”⁷⁵

Certainly there was a need for a change to the FIRMs in effect for New York City. In response to the 2013 proposed FIRMs, the New York City Mayor’s Office of Long-Term Planning and Sustainability supported research with regard to the flood insurance market in New York City one year following Hurricane Sandy.⁷⁶ De Blasio’s office was attempting to decode and understand the actual and realistic implications of the new FIRMs to the city’s residents and businesses, if they were to become effective. Prior to Hurricane Sandy hitting New York city in 2012 the NFIP had been planning two changes to the policy but, unfortunately, the changes were being implemented in 2012⁷⁷ around the same time Sandy victims were struggling to reconstruct. The two changes to the NFIP insurance policy were both intended to put the federal program, which had accumulated billions of dollars of cost overruns since Hurricane Katrina in 2005, on a stronger financial footing by moving toward more risk-based premiums.⁷⁸ The first change to the policy was the Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12) which eliminates the subsidies that existed for some classes of structures as well as phased out the grandfathering of certain structures to be effective when the FIRMs were updated.⁷⁹ The previous grandfathering policy put simply was: if a new map located these structures in a higher-

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ Dixon et al., *Flood Insurance in New York City*. iii.

⁷⁷ Ibid, xi.

⁷⁸ Ibid, xi-xii.

⁷⁹ Ibid, xii.

risk flood zone, owners would still be able to pay premiums that are based on that prior map. Eliminating grandfathering meant that thousands of homeowners and businesses would be required to pay much higher premiums. The second change associated with the new NFIP policy was the update of the FEMA map, which prompted the mayor's office research, that defines the flood-risk areas in New York which had not been updated since FEMA released its first map for the city in 1983.⁸⁰ Ultimately the major consequence of changes in the NFIP New York City map that FEMA released in June 2013 is the major expansion of the city's high-risk areas which nearly doubles the number of structures and residents in those areas which means more homeowners will also be required to purchase insurance. In 2013, roughly 37 percents of households living in owner-occupied units in the floodplain earned less than \$75,000 per year.⁸¹ With the projected increase in premiums, a \$5,000 premium would amount to 6.6 percent of a \$75,000 annual income,⁸² resulting in a massive economic hardship for many households. Similar to the consequences of redrawing flood maps in New Orleans following Hurricane Katrina, the value of these owner-occupied homes in the high-risk areas would also likely decline due to the magnitude of the premium increases. Consequently, it would be nearly impossible for many homeowners to stay in their homes, increasing the amount of foreclosures and short sales.⁸³ Again similar to post-Katrina New Orleans maps, lower property values would negatively affect New York City's tax revenue and make the city less desirable for new development.

The changes in the 2013 maps reflected a realization by FEMA that flood risk in New York City is higher than previous thought when the effects of climate change are considered.

⁸⁰ Ibid, xii.

⁸¹ Ibid, xvii.

⁸² Ibid, xvii.

⁸³ Ibid, xvii-xviii.

But this risk is likely to increase over time, putting more structures at risk because the 2013 updated map did not capture the consequences of future sea-level rise or the greater frequency of severe storms resulting from climate change because the maps FEMA released were based on unchanging sea-level values.⁸⁴ And that was the justification and grounds for the 2015 De Blasio administration's successful appeal of FEMA's flood risk calculations for New York City in the 2013 draft FIRMs.⁸⁵ Mayor De Blasio and FEMA announced an agreement to revise FIRMs in 2016 to provide more precise current flood risk data while also producing a map that will reflect future conditions that account for climate change.⁸⁶ The goal of the revisions is to assist New York City in making coastlines more resilient and climate-ready, while ensuring homeowners are not required to purchase more insurance than their current flood risk requires.⁸⁷ The NFIP's decision to redraw the flood maps was in conjunction with De Blasio's OneNYC resiliency program which "requires the best-available climate science and accurate flood maps"⁸⁸ to allow for the separation between the calculation of annual insurance premiums and the current risk from the necessary long-term planning and building required to adapt to rising sea level and climate change. With the declaration for new flood maps to be drafted, flood insurance rates in New York City were to continue to be based on prior effective FIRMs which saved coastal households tens of millions of dollars per year, in aggregate.⁸⁹ However, the city's building code would continue to reflect the 2015 preliminary FIRMs to ensure that new buildings are better able to withstand flood risk from rising sea levels and coastal storm surge⁹⁰ and so that recovery

⁸⁴ Ibid, xv.

⁸⁵ "Mayor De Blasio and FEMA Announce Plan to Revise NYC's Flood Maps," *Emergency Support Function Annexes* (2016).

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Ibid.

⁹⁰ Ibid.

from Hurricane Sandy could continue without interruption. In conjunction with the announcement of the revision of New York City FIRMs the New York City Mayor's Office of Recovery and Resiliency sponsored research that would, again, develop projections for how changes in flood maps and pricing policies of NFIP might increase premiums.⁹¹ More than 40 percent of owner-occupied, primary residences that are located in the new high-risk areas of the FIRM in effect in 2017 are low income so, not surprisingly, the flood insurance take-up rate post- Sandy within the high-risk areas was only 43 percent and not all of those insurance policies fully covered flood-related losses.⁹² The average premium paid for flood coverage in June 2016 was \$1,880 in high-risk zones and \$530 in properties located outside of the high-risk zone.⁹³ Given this, flood insurance is considered burdensome for about 25 percent of total households in owner-occupied, primary households; 41 percent of those living in low-income households; and 64 percent of those living in extremely- and very-low income households.⁹⁴ However these percentages are projected to skyrocket with the implementation of the premium projections based on the preliminary-FIRM (PFIRM). The expected median premium for newly mapped properties will gradually increase from \$500 to \$2,700; median premium for properties in high-risk zone will increase from \$3,100 to \$5,600; and at least 25 percent of property owners living directly on the coastline would could potentially pay up to \$12,300 annually for flood insurance coverage.⁹⁵ With these premium increases the number of households for whom flood insurance coverage would be burdensome would increase by 33 percent⁹⁶ from 25 percent. And because flood insurance premiums are capitalized into property values, the projected increases in

⁹¹ Dixon, Lloyd, et al., "The Cost and Affordability of Flood Insurance in New York City: Economic Impacts of Rising Premiums and Policy Options for One- to Four-Family Homes," *RAND Corporation* (2017): iii.

⁹² *Ibid*, xviii.

⁹³ *Ibid*, xviii.

⁹⁴ *Ibid*, xviii.

⁹⁵ *Ibid*, xx.

⁹⁶ *Ibid*, xxi.

premiums decreased property values which decreases the value of property tax base as well as creates higher mortgage default rates. Property tax revenue is projected to decrease by \$22 million⁹⁷ in New York City if the PFIRM is enacted.

Theoretically this should result in a bolstering of development within New York City because property values would be low, however, realistically that is not the case. The New York City waterfront has become more available and accessible post-Sandy due to destruction and victim buyouts by developers but it has also become more expensive. In 2010, the value of property within the 100-year floodplain was \$58.7 billion and by 2014, that value had climbed to \$129.1 billion.⁹⁸ Due to this increase in waterfront property value, it has become more urgent for developers to invest in resiliency projects so that properties can withstand the effects of climate change. With the PFIRMs comes more stringent building codes that were enacted after Hurricane Sandy and some residential and commercial developers have embraced the new standards as a vital long-term investment because if retrofitting is fixed into construction costs now, it's considered to be a marginal investment that protects the property and residents.⁹⁹

While the progress of planning and resiliency has greatly improved from that of Hurricane Katrina in New Orleans in 2005, there is still much room for improvement from local governments in New York City. In contrast to the oblivious political climate change “debate”, local government in New York City has learned from recent extreme weather and flooding events that they need to act to improve their planning capacity and infrastructure. Federal agencies are also acting, with limited resources, into protecting against climate change-related disasters. There is a necessity for a best practice to be implemented to equitably protect low-

⁹⁷ Ibid, xxi.

⁹⁸ Chen, “In New York, Drawing Flood Maps Is a 'Game of Inches’”.

⁹⁹ Ibid.

income residents located in vulnerable areas and rebuild and reinforce public affordable housing in the event of climate change-related disaster.

Conclusion

Throughout history catastrophic natural disasters have periodically littered the globe causing widespread destruction, which have resulted in changing landscapes of entire territories. Natural disasters will continue to pierce nations worldwide but the difference between historical and recent disasters is the frequency and magnitude in which they are occurring. The acceleration of storms and changing weather patterns can be attributed to the effects of anthropogenic-induced global climate change. While partisan political discussions continue to argue that climate change is a debate, as if there is a right and wrong side, the effects of more frequent disasters are drastically affecting U.S. cities.

Evidently, natural disasters are becoming more common in the United States. In the twentieth century, fewer than 20 percent of U.S. counties experienced a disaster each year.¹ By 2019, 50 percent of all U.S. counties have experienced, and continue to experience, natural disasters.² Climate change is driving more severe droughts, floods, wildfires and hurricanes. Various local and federal agencies throughout the country are working to protect communities and redevelop neighborhoods in the aftermath of climate-related natural disasters. These plans to mitigate the dramatic effects of climate changes in the U.S. are only possible by learning from what could have been done in terms of processes and relief plans after previous natural disasters such as Hurricanes Katrina and Sandy.

By the numbers, Hurricane Katrina was a far more devastating storm than Hurricane Sandy. Hurricane Katrina was a category 3 hurricane by its second landfall in New Orleans in 2005 while ‘Hurricane’ Sandy was officially labeled a post-tropical cyclone in 2012.³ Hurricane

¹ Marable, Manning, and Kristen Clarke, *Seeking Higher Ground: the Hurricane Katrina Crisis, Race, and Public Policy Reader* (Palgrave Macmillan, 2008), 60.

² Marable and Clarke, *Seeking Higher Ground*, 60.

³ Newman, Andy, “Hurricane Sandy vs. Hurricane Katrina,” *The New York Times* (2012).

Katrina resulted in a total of 1,833 deaths while Hurricane Sandy caused more than 200 deaths in seven counties, including 132 in the U.S.⁴ Approximately one million housing units were damaged from Katrina, including 126,000 severely damaged or destroyed while in New York 305,000 housing units were damaged or destroyed post-Sandy.⁵ The estimated cost of Hurricane Katrina was \$148 billion while the total in New York alone was \$71 billion due to Hurricane Sandy.⁶

Most importantly, in both cities after awaiting relief and rescue that seldom arrived, residents were forced to evacuate. Although many evacuees sought and received shelter nearby, in the weeks and months following the hurricanes, evacuees were scattered throughout the country. In the years following Hurricanes Katrina and Sandy, thousands of former residents remained displaced. Some residents continue to possess the desire to return to their previous homes but do not have the means, other residents have chosen to create new homes elsewhere, and for the residents that found a way to return to their disaster-stricken cities, they quickly discovered that they could not find a way to live their similar lives prior to the storms. Residents who were displaced as a consequence of Katrina and Sandy, and other natural disasters, have been mostly labeled as refugees, victims, survivors, evacuees, exiles and environmental migrants. Similarly, the term “internally displaced persons” refers to residents forcibly dispersed from homes within a country by a disaster, which can also be referred to as “unmitigated forced displacement.”⁷

On the other hand, after Hurricanes Katrina and Sandy there were hundreds of thousands of disadvantaged residents who remained in the cities as a consequence of lack of accessibility to

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

⁷ Weber, Lynn, and Lori A. Peek, *Displaced: Life in the Katrina Diaspora* (University of Texas Press, 2012), 252.

evacuation opportunities. They too were considered to be internally displaced because although they did not leave, their homes were destroyed in the storms. Often, these socioeconomically disadvantaged residents relied on (and are still doing so) the availability of public housing developments in the cities. This creates an entire population of vulnerable storm survivors in search of shelter and basic needs. These human rights both were not adequately available in the aftermath of both natural disasters as a result of inadequate disaster planning and resources.

Natural disasters share a common feature with accelerated processes of economic development as seen in post-disaster New Orleans and New York City. Although there are many different rates at which this occurs, it is a result of large-scale displacement and the introduction of completely different demographics. This phenomenon that has been identified as “environmental gentrification.” The process of environmental gentrification occurs after a natural disaster and rapidly accelerates the process of traditional urban gentrification. Consequently, environmental gentrification magnifies the underlying socioeconomic and environmental inequalities in place long before the natural disaster.

New Orleans has experienced a history of residential racial segregation that has resulted in racial disparities in wealth, access to opportunity and vulnerability to disaster risk. Historical residential racial segregation in New Orleans caused the isolation of certain racial compositions in different neighborhoods, which made the various areas of the city easily distinguishable from one another. The concentration of low-income and minority populations within New Orleans was located in an area with high vulnerability to flood risk, so when Katrina arrived in the city it was these neighborhoods that were affected the most. Katrina caused unmitigated forced displacement of majority of the low-income neighborhoods due to lack of availability of livable homes. The combination of newly accessible land in these neighborhoods and the drastic

population decline, as a result of the displacement of minority populations, created an opportunity for new private development instead of reconstruction of previous properties, including public housing developments. The neighborhoods experienced a period of social engineering during redevelopment which was the creation of synthetic urban culture, or gentrified culture, in place of the authentic, pre-disaster, urban culture. This social engineering was encouraged and implemented by various politicians, policymakers and private corporations who wished to update and improve the city's economic, political and global position within the U.S. The social engineering encouraged the changing racial composition of previously minority neighborhoods, thus instigating environmental gentrification. This current pattern in the process of environmental gentrification can also be applied to post-Hurricane Sandy New York City and will be mirrored by additional coastal cities if climate change resiliency planning is not implemented through more thorough climate action plans throughout the U.S.

Currently, local, state and federal agencies only spottily provide the necessary infrastructure and policy frameworks to protect against climate-related natural disasters and events. There is an imperative necessity to quickly incorporate the vulnerability of low-income residents into adequate climate action planning, federal aid and environmental regulations. Climate change action plans should not only reflect infrastructure and societal resiliency but also present the dynamic climate risks that will inevitably affect coastal cities. Such dynamic climate risks will also require the adaptability of local, state and federal agencies to adequately provide the necessary and changing requirements for relief and redevelopment. The importance of such adaptability can be seen through the drafting of flood maps because such maps must reflect the continuously changing risk due to climate change. Currently, NFIP FIRMs are based on national averages of flood risk which is an unrealistic standard in coastal cities

where sea-level rise will be a more impending issue. Additionally, the short-term nature of current flood insurance policies restrains an active collaboration between insurers and policyholders in reducing exposure to flooding. The introduction of long-term federal flood insurance contracts that are connected to properties, rather than homeowners, could ensure the affordability and reliability of coverage. If flood risk maps more accurately represented the realistic risk of sea-level rise in coastal communities, the expensive nature of flood insurance could be adjusted to more affordable prices, making policies more accessible for low-income residents who could not previously afford them.

The inaccuracy of flood maps and zoning negatively affects the reconstruction and redevelopment process post-disaster. More specifically, the absence of realistic risk allows for the introduction of private development post-disaster because there is no plan in place for reconstruction of previous properties, such as public housing developments. Policies should be implemented in coastal cities to mitigate future displacement of residents most vulnerable to high-risk natural disasters but also plans for the return of those residents rather than capitalizing on the newly available land and property. Even though in post-Katrina New Orleans public housing did eventually become available, the supply was limited and concentrated in one area of the city. In post-Sandy New York City, the population of low-income residents are also becoming concentrated in specific neighborhoods as a result of exclusionary zoning making some areas far more expensive than others. The residents and businesses that can afford to purchase and expand property in those areas continue to introduce development and do so in the city centers without interruption from minority populations. Such development was encouraged by public officials and private corporate partners in anticipation of economic stimulation and improvement of city-wide reputation.

Cities, however, can mitigate climate change risks. For example, flood risk in New Orleans and New York City, while combating historic patterns of engineered segregation by zoning for higher population density at higher elevations and simultaneously enacting inclusionary housing policies. By creating and enforcing comprehensive and inclusionary housing policies and equitable zoning ordinances, city residents are permitted to live in synchronization with flood risk and other types of threats. Regardless of race, income, geographic location or elevation, it would be understood by residents that policies and insurances are in place to ensure basic health and safety standards as well as access to participation in the policymaking process. Inclusionary public housing policies that are built to current flood protection standards and easily accessible by low-income and minority residents would ensure that natural disasters can no longer be associated with unmitigated forced displacement followed by the re-segregation of socioeconomically challenged residents. Racial wealth disparity that is compounded by the potentially corrupt decisions at all levels of the government and throughout the private market post-natural disaster cannot be eradicated with isolated policy changes based on public pronouncements. There should be a cohesive, coordinated and singular focus on protecting and reinforcing the accessible, equal and democratic participation in the facilitation of wealth creation and well-being after a natural disaster so there may not be an opportunity for environmental gentrification.

The Katrina and Sandy disasters were microcosms of the broader political landscape with regard to natural disaster mitigation, preparedness and response. In the aftermaths of both hurricanes, changing economic conditions, growing privatization, housing crises and diminished federal relief funding augmented the ranks of residents struggling to survive and increased the number of displaced residents. Natural disaster mitigation plans, which are to be included in

cities' climate actions plans, should be complimentary of political organization, meaning service and survival of residents should be done so through the organization of political players and federal agencies before the disaster, not during and after as it did in New Orleans and New York City.

Above all, climate change resiliency and climate change action plans require the complete commitment, cooperation and adaptability of all resources and services – both locally and nationally. Recovery after a natural disaster often requires resources that go far beyond the funding supplied by the federal government so that is why the adaptability of all social organizers is crucial. Commitment of resources is also required because the timeline of post-disaster physical and societal redevelopment is not static nor the same after any two natural disasters. The long-term maintenance of cooperation and commitment after a natural disaster has the potential to positively influence the outcome of redevelopment. Also, the engagement of many sectors within the city in developing and presenting a statement of principles about reconstruction is a critical action that promotes transparency to the residents of the recovering city. The presence of transparency throughout post-disaster recovery periods would ensure that the policymaking process is inclusionary for all residents. In post-Katrina New Orleans, city officials worked privately with corporate developers on reconstruction plans and began implementation without any indication to the city's general public, so there was no opportunity for residents to voice concerns or inquire further. Comparatively, in post-Sandy New York City, private developers gained control of property by purchasing damaged homes to desperate residents who were attempting to recover from the disaster and began development right before the eyes of the residents who could not afford otherwise.

Although the U.S. as a country is currently experiencing polarized politics, crippling national debt and an ever-expanding gap between socioeconomic statuses, climate change adaptation and resiliency planning should hold greater priority than it does in regard to national policy formation. For this reason, local government have already learned from recent extreme weather events, such as Katrina and Sandy, that actions must be taken to improve planning capacity and infrastructure. While federal agencies are acting, limited resources are available for protection against climate change-related disasters. Highly engineered solutions are possible, but unreliable as long-term strategies in the absence of a leveling off of global temperatures and will be cost-prohibitive for low-income communities, once again inviting in the opportunity for environmental gentrification.

The effects of natural disasters, accelerated by climate change, do not have to be treated as they currently are in the United States, which is with shock and chaos. However, as national insurance policies and federal disaster relief systems stand now, many Americans will be left more vulnerable and others will be more resilient in the face of climate change. The determinant of which Americans are advantaged and disadvantaged appear to mirror existing racial and socioeconomic inequalities. The political and environmental fight should be to create a new national commitment to complete planning and recovery that respects people's right to return home and their need to be treated with respect. Climate action planning and mitigation should be founded on a vision of complete recovery for the city and the affected residents. Climate action plans should be based on participation and inclusion. They should embody respect in interpersonal interactions. Natural disaster recovery should not only aim to reconstruct damage properties and landscapes but also aim to help rebuild the lives of the people affected through respect of culture, race and social ties. The building blocks of a healthy society help to create a

stable foundation, which aids in ensuring the future well-being of the affected residents and that of the city itself.