CHAPTER 3

Louisiana

Collaborative Energies and Post-disaster Solutions

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Recognizing the proposition of this text to be advocacy of a conceptual framework of alternative ways in which post-disaster societies of the African diaspora might navigate innovative approaches to achieving sustainable development, this chapter sets out to highlight the inherent value in developing solidarity networks to fight for a world in which dignity, self-determination, and a sustainable future becomes a reality. Emerging post-disaster societies in the US Gulf Coast have found community capital a meaningful way to progress in pursuit of new trajectories for growth and sustainability. The Gulf South is a region where water, oil, gas, coal, and nuclear energy are still key segments of the economy. Louisiana communities, particularly Black, brown, and indigenous, are becoming increasingly vulnerable to the subsequent land loss, rising seas, natural disasters, crumbling infrastructure, and polluting energies weakening an already fragile ecosystem.

The climate crisis has compounded vulnerabilities in Louisiana. In a recent online newsletter on the Louisiana environment, a staff writer posited that an inability to achieve net zero release in greenhouse gas emissions over the next six years would cause Louisiana to suffer damage in excess of $5.5 billion (Schleifstein 2022). In this scenario, the cost of recovery for Louisiana coastal communities would double as a result of climate change. Such observations, regularly shared in environmental newsletters, such as the Catch Basin, that report on environmental issues affecting Louisiana's land, air, and water, bring the deterioration of the Louisiana coastline into stark perspective for residents. Communities have begun to understand what residents would experience in the advent of climate change.

This has prompted a recognition of the urgency for action toward appropriate climate management in Louisiana and become a turning point

for solidarity among local communities who have opted to connect their struggles and overcome the systemic inequalities that divide them. Movements and coalitions are united to create a resilient and sustainable future for all; their fight is anchored in the production of knowledge residing in their communities and reposed in the histories, realities, and power of the Gulf region. By advancing grassroots policy and practices that center laborers, farmers, fisher-folk, tribal nations, and frontline communities in a just transition away from extractive economies, sustainable development can be attained. Water management is perhaps the most immediate, but far from the biggest, challenge communities in this region face. Any attempt to confront the challenges for communities in the Gulf region and especially Louisiana, the focus of this chapter, must take into account the aspirations of residents of the region. Those aspirations, at the very heart of this study, lie in the attainment of a better life for vulnerable communities in Louisiana's disaster-prone, diasporic societies.

Seeking Quality of Life

Aristotle spoke a great deal about our attempts as humans to live a "good life." He frequently compared this to an archer's attempt to aim an arrow; the arrow is more likely to hit the target if the archer has a target at which to aim (Wilburn 2015). Similarly, humans are more likely to live a "good life" if they know what makes their lives good. Where and how we aim to hit our target varies depending on the conditions in and circumstances under which we live. In aiming, the archer must look to what suits the occasion, and this involves paying attention to and adjusting for all of the factors that would otherwise make us miss our target (Koehn 2012). What is the direction and strength of crosswinds? Are they constant or intermittent? Are there unexpected moments of turbulence? As these conditions change, the process of hitting the target looks different each time. Are we all aiming at the same target? If so, from what vantage point? Do we all have a fair and equal shot at a "good life"? Is it within our reach (Mendie and Udofia 2020)? These are the questions collaborative efforts in Louisiana must answer.

What do we consider common features of a "good life"? Democracy? Economic development? Human rights? All of the above? If so, then in what order should we initiate action? If these are common features, then why does democracy in advanced industrialized nations work better than in developing nations where growth fluctuates, and political instability is a constant (Gerring 2010)? Perhaps developing nations have been aiming at targets that were never their own in the first place. Maybe they have been following in the footsteps of developed nations, whose conditions

are calm and consistent and targets clear. Our attempts to define and determine ways to achieve the "good life" need also to take into account this variety, and it is more complex than archery targets have traditionally been (Wilburn 2015).

Robert Dahl (1989) asserts that a continuing responsiveness of a government to the preferences of its people relies on the government's ability to perceive their preferences as well as act upon them—only then can the "good life" be achieved. In this case, the government is the archer, and the target is their citizen's preferences. Will they take their shot? If they do, will they miss the target entirely? It is possible that they may aim somewhere other than at their primary target; perhaps at a target that is in their own best self-interest and not in the best interest of society at large. How does this scene present itself in post-colonial societies—particularly those of African origin? This chapter will take a look at sustainable development within the context of Louisiana, a society that exists within the borders of the United States of America, a nation that is characterized as the epitome of industrialization and the world's largest national economy. Even then, Louisiana has consistently ranked lowest (#50) in the nation across eight categories: health care, education, economy, infrastructure, opportunity, fiscal stability, crime and corrections, and natural environment (Louisiana Rankings 2022, Jacobs 2023). It is disaster-prone in every way possible. Is it a shock that many have viewed Louisiana in ways similar to their view of a developing nation? If the "good life" as defined by the United States is clear, then why does Louisiana continue to fail and rank last? Why do residents, time and again, continue to miss their target, one they, supposedly, collectively share? How can the Afro-diasporic and other natives of Louisiana acquire the "good life" when their government is not responsive to their needs?

Residents of Louisiana can be better served by striving toward the "good life" as they define it themselves, by being the archers in their story and hitting their own targets. By doing so, they will continue to uncover new ways (or revert to traditional ways) to reform the political systems of oppression that attend development. At the local level, over the past decade, citizens have engaged in innovative, alternative strategies for achieving pressing goals, not just for themselves but also for their communities. They have done so by leaving habits of dependency and crises of legitimacy behind while utilizing their intellectual capacities and reclaiming cultural wisdoms and the traditional energies that have sustained them over generations. Louisiana is culturally different from the rest of the United States with its enduring African, French, Caribbean, Spanish, and indigenous roots and influences (Garrigus and Hall 1994). In knowing their past and leaning into these wisdoms, Louisiana communities have learned

how to be resilient, manage catastrophe, and rebuild lives, cultures, and patterns of existence on their own terms.

Louisiana in the Looking Glass

If there were a poster-community for "climate resilience," it would be New Orleans, the cultural capital of Louisiana. Residents of this small metropolis, snuggled along the Mississippi River, bound in every direction by water, have been the definition of resilient in terms of the infrastructure and the painful past and present lives residents have lived. If you were to conduct a search on disaster and resilience, in any database, you would find thousands of news articles, dissertations, books, and podcasts on New Orleans. Many of them carry the same theme of praising residents for their resilient culture. Yet, somehow, one of the most historic cities in the United States has become more closely tied to its trauma than to its recovery. As Judith Rodin, President of The Rockefeller Foundation observed in her keynote address for The Atlantic–Live: "New Orleans is the hot bed, the test bed for all of these [climate resiliency] ideas. It was the springboard for half a billion dollars we've invested into resilience building into cities of all sizes around the world for the last ten years . . . Now it's the template for the hundred resilient cities mode" (Rodin 2015). To become resilient, one has to overcome a hardship or difficulty. It implies that one has learned from a difficulty and grown from it. Residents of Louisiana have gone beyond resilient in many ways and have experienced several moments of collective trauma that have cemented their ability to withstand subpar living standards. Collective trauma, as defined by *Psychology Today* (Turmaud 2022) is the impact of a traumatic experience that can affect a group, community, or nation. Collective trauma is more dangerous than individual trauma because it distresses an entire community, leading to potentially negative consequences that can be built into the fabric of that community. This collective trauma can alter social interactions, political systems, structures, and interactions with others within and beyond the community (Turmaud 2020). In the twenty-first century, the collective trauma felt by residents is now rebranded as resilience, a positive attribute meaning communities can experience more anguish and brutality and bounce back with ferocity. Ironically, the attribute of resilience, collectively or individually, is that it urges the community to assume more than what is expected of another less resilient community. Thus, Louisiana has been the go-to petri dish and lab rat for governments, foundations, engineers, investors, and inventors alike to test good and bad theories because the people's resilience has been established.

For thousands of residents of this city below sea level, this has meant it has been the site of failed experimentation and repeated climate and man-made trauma. The trauma that defines the borders of New Orleans has informed many innovations in music, cuisine, architecture, and even engineering. It has also been the blueprint for failed strategies. Social and economic traumas, as defined by the Trail of Tears, the transatlantic slave trade, classism, neo-liberalism, and oppression have expanded the meaning of resilience to residents of New Orleans. As the unintended perfector of the philosophical concept, residents have taken on the meaning as a description of their self-worth. It is now an identifying marker of the local, the survivor, and the tolerant. To be resilient in New Orleans, you must have lost someone and suffered enough to earn the title. As a result of this proudly worn moniker, residents live in a constant state of recovery. They distrust the disjointed system that continues to underinvest in them and repeatedly fails the community, contributing further to its trauma and civic apathy. In all, New Orleans's resiliency is a project defined by top-down failure of government and neoliberal policy, exposed by the impacts of climate change. More specifically, ravaged by the waters that have created, shaped, and influenced the city, residents have normalized collective trauma and, arguably, find themselves collectively in a constant state of post-traumatic stress disorder.

Louisiana

Disaster in Context

In Louisiana, disaster is presented in numerous formats: super storms, flooding, crumbling infrastructure, government negligence, pandemic, unemployment, corporate greed, and extractive industries, just to name a few. Some maintain that Louisiana is both vulnerable and resilient to disaster, but these disasters are man-made and cannot be detached from the context of colonialism, which created both the economic conditions for disaster and the social conditions that limit Louisiana's capacity to be resilient to it. First and indigenous peoples are chroniclers of their environment, noting and marking memories to events, seasons, and physical changes to their environment (First Peoples Conservation Council 2022). This awareness aids their survival, provoking the concern that resilience and survival may equate to the "good life" in the view of some. The target for vulnerable communities of Louisiana is knowing where and how to build, where to find food, where and how to protect communities, and how to be safe. What happens when the lived environment is changed by disaster, so much so that communities' targets or their sense of the "good

life" become unclear? When the landscape changes so rapidly, fishermen can no longer navigate by sight and instead must rely on GPS and radar systems. Leaving the coast for a few months of the year could mean not recognizing certain places when families return. In certain communities outside of New Orleans, residents cannot visit ancestral burial sites because the landscape has undergone devastating change (Forrest 2019).

Western forms of development, with industrialization and the prioritization of extractive industries, have clashed with traditional knowledge and ways of thriving within the lived environment. For example, traditional practices like burning portions of the marshland off the coast of Louisiana each year is now considered dangerous or illegal even though it has been proven to promote healthy regrowth and flush out game for hunting. Other forms of development like oil drilling, agricultural runoff, and flooding have vastly polluted the water while also contaminating the fish. This negatively impacts fishermen, whose livelihood comes from the seafood industry and tribal communities, like the United Houma Nation, whose diets largely consist of fresh fish and homegrown vegetables. In an effort to continue striving for sustainability, tribe members have adjusted their aim and raise beds to garden their crops, cultivate land away from their homes, and purchase fresh produce from others (Forrest 2019).

We can look at extractive industries more broadly and recognize the detrimental effects they have had on climate change and on frontline communities vulnerable to their impacts. These industries are warming the planet and weather events are becoming more and more extreme as the years go by. In the year 2020 alone, Louisiana endured five major storms. It has been eighteen years since Hurricane Katrina (2005), and the devastation is still perceived as third world devastation in a first world country (Bay Area News Group 2016). Victims of extreme weather events like Katrina are overwhelmingly poor, Black, and/or from indigenous communities. These communities have experienced physical and metaphysical damage and the impacts are still seen and felt today. The government and corporations provided very little support in the aftermath and delays in relief and rescue left millions of residents without food, water, or shelter for weeks. This severely undermined the economic stability of these communities in the years since, leaving millions vulnerable to disaster capitalism and private land developers buying up housing stock and displacing thousands of residents from their homes (Adams, Van Hattum, and English 2009).

Hurricane Ida (2021) was a Category 5 storm that occurred exactly sixteen years after Hurricane Katrina, whose impacts were devastating. Louisiana suffered tremendously in its wake. There was no electricity; heat

indexes registered a hundred degrees or more; there was no running water or gas; homes were demolished; there was catastrophic flooding, and many residents were trapped in their attics or on their rooftop. The service industry was left without work for weeks without a sense of when they would be able to return to work. Those who had the capacity and resources to evacuate did not know when they would be able to return home or what quality of life they would have, compared to what they once had. Louisiana bayou communities were hit hardest and received very little media coverage or support (Flowers 2021). This was/is not what a government responsive to the needs of its citizens should look like. It begs the question whether a sustainable life is possible or within reach for diasporic communities in Louisiana. Are some communities forced to find ways to thrive by aiming at their own targets with their own arrows? Knowledge production of resident capital can assist such communities to attain their immediate goals by generating homegrown strategies for environmental sustainability.

Beyond super storms and extreme weather events like Katrina and Ida, disasters present themselves in other forms as well. The latter may derive from geographic segregation, generational poverty, lack of accountability for corporate powers and elected leaders perpetuating harm in diasporic communities, historic and current political decisions, and legislative measures that place Black, brown, and indigenous people directly in the zone of disaster, environmental racism, and leaders prioritizing profits over lives. An example of this is the area commonly referred to in the Gulf region as Cancer Alley, an eighty-five-mile stretch of land along the Mississippi River that is known for its nearly 150 oil refineries, plastic plants, and chemical facilities that release cancer-causing emissions into the air, water, and soil (Castellón 2021). Some call these petrochemical plants modern-day plantations because fossil fuel companies have historically exacerbated and exploited segregation. This stretch of land was once the site of plantations with generations of enslaved Africans. Mossville, Louisiana, for example, is a small unincorporated town founded by formerly enslaved people and nearly all of its Black residents have been bought out by the South African petrochemical giant Sasol to build a chemical complex.

Although it has been propagated in some circles that communities of color move into areas where toxic waste sites and landfills are located, there is little to no evidence to support that view. Instead, these sites are often built where poor communities of color have lived for generations. In the 1970s, wealthy white communities became aware of the health risks associated with hazardous facilities and successfully increased their opposition by leveraging their economic and political advantage. Consequently,

petrochemical facilities began building their sites near poor communities of color to avoid any delays or expenses associated with building in white affluent neighborhoods. Poor communities of color do not have the same leverage or advantage. GIS mapping has found that polluting industries are in areas with the highest percentages of African Americans, the lowest average household income, and the most residents without a high school diploma (Blodget 2006). Fossil fuel companies exacerbating and exploiting segregation in this way are thus compared to modern-day plantations (Castellón 2021). Black environmentalists in Louisiana are fighting for legislation to protect their communities from racist policies that have worsened their social and environmental burden. The policies that are enacted are ones that fail to address the legacy of racism that contributed to the disasters in the first place. Politicians, too, bear responsibility for failing to enact the same equitable protections and relief for communities of color as for wealthy, white communities. In light of these experiences, it is clear that alternative solutions to sustainable development are urgently required by communities.

Why a Knowledge Economy?

Eighteen years after Hurricane Katrina, and seven years after Ms. Rodin's presentation, a small movement of locals began to redefine "resilient" by creating their own pathways rooted in indigenous and African practices, science, and self-determination. Their focus was on Louisiana's infrastructure. Specifically, the natural infrastructure movement set out to correct and un-engineer centuries of trauma and experimentation, thrust upon residents to navigate without appropriate resources. Before considering opportunities for adapting the infrastructure, however, it is appropriate to explore how the challenge of developing a knowledge economy might lead to a prosperous and effective movement to create resilient communities collaboratively without reliance on governments or foundations for guidance. And while both government and foundations are necessary and have been present throughout the growth of the natural infrastructure movement, for example, residents have pushed external actors to take a lesser role in its expansion. As a result, residents are seeing their quality of life improve through a combination of benefits from green infrastructure and active community participation. The waters surrounding the city have now been co-opted into an opportunity to explore the benefits of knowledge capital and collective action, serving as a physical and metaphysical healing tool that cannot be taught by actors external to the state.

Environmental History of Louisiana

Without reflection on the past, Louisiana's communities are aware that new movements may be doomed to repeat the ills of the past. Here, we will revisit the impact of six climate and man-made events that now determine how a green infrastructure movement may redefine resiliency in Louisiana and harness collective knowledge to recover from trauma. Through a backdrop of repeated trauma, we delve into how residents have conquered these setbacks to become local leaders in green infrastructure, making Louisiana, and especially New Orleans, a projected national leader for climate resilience and natural infrastructure.

Ojibwe of Tears and Trauma

New Orleans has a unique, antiquated infrastructure system that is the most expensive in the United States, making its natural and built environment disjointed, fragmented, and substandard. Because of the city's complex relationship with the land, this city has struggled to balance green space, water, and disaster prevention for centuries. In recent years, the city has taken action to address its painful relationship with the land, water, and its residents. This city has many problems related to green space, but the original problem is rooted in the territory's history. Before the Mississippi River was walled off by levee systems, dams, and industry, it was free to move as it pleased. New Orleans is sometimes referred to as "The Accidental City" (Powell 2013) because it was built by the rich sediment of the Mississippi River over 40 million years ago. Over time, as the river swayed back and forth across the coastal plain, Louisiana spanned approximately five thousand years and was the last land formation before reaching the Gulf of Mexico, known as the Mississippi Embayment. Connecting waterways from all over the country, the latter moved sediment, silt, and sand to form Southeast Louisiana (Severin et al. n.d.). To give context to the abilities of the river to shape and create land, the waters of the Mississippi River were so strong and rich that they covered a small barrier island of sand known as Pine Island, which is now the base of New Orleans (Campanella 2016). The subtropical environment of the Louisiana Delta also meant that the ecosystem was diverse and plentiful. This made it a prime spot for over twenty indigenous tribes who traded goods, supplies, food, and medicines up and down the Mississippi River Valley, known to the indigenous tribes as Ojibwe or "Great River." New Orleans became known as *Blvbancha* or "land of many tongues" by the Chitimacha Tribe because of how diverse, vibrant, and plentiful the lands were (Burton, Smith, and Appleford n.d.; "Yellow Fever" 2022; Levenson 2018). The

indigenous tribes of Louisiana understood that the lushness of the Delta came with a set of unique ecological expectations. Tribes flourished as they worked with the Mississippi's strong currents, understanding when it would flood and when it would plateau. They knew when certain species of birds, mammals, fish, and insects would be copious or sparse, based on the season. The largest indigenous mounds and historical sites can be found from the headwaters in Minnesota to Louisiana. Because of how plentiful resources were, they thrived undisturbed by outsiders until the 1500s (Burton et al. n.d.).

The Mississippi River Valley was first discovered by Europeans in 1541, pinning the beginning of the history of racial and climate trauma in Louisiana (Johnson, Fry & Co. 1858). French explorer René-Robert Cavelier, sieur (lord) de La Salle claimed the Delta for France, giving Louisiana its name after Louis XIV and his wife Anna. La Salle and other French businessmen saw the strategic importance of controlling the Mississippi River. The ability to control the waters of the Mississippi meant controlling commerce between the Americans to the East and the Spanish to the West. Over the next 300 years, indigenous tribes battling for their ancestral lands were enslaved or died of disease brought over by the Europeans. The Indian Removal Act of 1830 marked the final stage of the nineteenth-century vision for the expansion of the transatlantic slave trade, which had already begun in 1619 (Hannah-Jones 2019). When Louisiana was claimed by the French in 1682, they had brought slaves with them from Africa and other colonies such as Haiti. From 1619 to 1830, the French, as did all other European powers of the time, embedded slavery into their economy, culture, and social systems. When Thomas Jefferson purchased Louisiana on 30 April 1803, the United States not only acquired Louisiana but also the entire Mississippi River Valley and the central plains, thus allowing for further expansion of the United States, human conquest, and conquest of the river's economic potential (De Cesar and Page, 2003). Alexis de Tocqueville, French aristocrat, historian, and political philosopher witnessed the trauma firsthand and lamented the fate of the Indians, who had their families with them and brought in their train the wounded and sick, with children newly born, and old men upon the verge of death. The Indians, without tents or wagons, and very few provisions, embarked to pass the mighty river, in silence, knowing their calamity to be irremediable (Bill of Rights Institute n.d.).

This moment of national and localized trauma was the first of many. For the Delta region, this meant that indigenous knowledge of the land, waterways, and its lush ecosystem would, in many cases, be lost for centuries if not forever. Some indigenous tribes were able to elude white settlers and others signed deals that allowed them to keep their lands

if they cooperated. This cooperation meant assimilation, isolation, and indefinite oppression for all tribes of the once thriving Mississippi River Valley. Today, the Chitimacha Tribe is the only tribe still living on a portion of their ancestral lands.

The Transatlantic Slave Trade

While indigenous tribes were being removed or killed, the transatlantic slave trade was expanding, making the need for indigenous land more valuable, driven by the thriving plantation economy. Thanks to the Mississippi River's fertile land and subtropical climate perfect for crop growing and its access to major waterways for trading and selling, the Mississippi, and surrounding lakes, bayous, and swamps made New Orleans the perfect place for white male business owners to prosper. Innovations such as the cotton gin, creole sugarcane, and the steamboat made New Orleans and Louisiana an economic powerhouse throughout the time of slavery. Several years after New Orleans was founded in 1718, it became the busiest slave market in the south. More than 135,000 enslaved Africans were sold in the heart of the French Quarter. This provided the labor for hundreds of plantations along the banks of the Mississippi River. Products cultivated by the enslaved included sugar, indigo, and cotton. By 1860, almost half of the Louisiana population comprised the enslaved. Among their many tasks, enslaved Africans had to cultivate crops, tend to livestock, and farm food for their own families as well as the plantation owners' families. Enslaved families also had to build plantation homes, stables, and all other forms of infrastructure common in the United States. What was unique in Louisiana was that the enslaved had to build levees and other forms of drainage, which was considered the hardest and most brutal work of the time (Louisiana State Museum n.d.).

Plantations were strategically built near waterways to move and sell product faster. Plantations, farms, and other industries in the Delta region alongside smaller rivers and lakes were prone to flooding. This meant that the enslaved were charged with building complex levees and drainage systems to prevent or reduce damage to their homes and products. It was no small feat to build drainage. "Levees required extensive upkeep and were under constant surveillance for seepage and weakness. Planters tasked their slaves with hauling clay for structural reinforcement, tending the grassy slopes, clearing clogged sluices and ditches, and cutting trees whose root systems would damage the levees' structural integrity" (Davis 2018). For many of the enslaved, working the levees was worse than being in a chain gang and meant endless days and nights of hard labor. To make matters worse, these levees were often not led by engineers or architects.

Plantation owners or politicians gave orders to the enslaved. Almost every spring, when the river was high, or after a storm, the levees would fail or sometimes be sabotaged by competing plantations. Failed levees meant that crops protected by the levee systems, also failed. Thus, the enslaved were not only further oppressed by their owners and the government but they were subject to the constant whims of nature. It was in the slaves' own interest to ensure the structural soundness of the levees and drainage lest they face more backbreaking labor in the fall and winter (Rodin 2015). Work songs to this effect have been recorded.

While the Mississippi River could serve as a means of escape to the underground railroad, or through the swamps into hard-to-find indigenous tribes known as Maroons, the collective memories of the enslaved in Louisiana was shaped by the river's entanglement with white colonizers' desire to conquer the river, the land, and the people simultaneously. Because indigenous tribes and the enslaved could not read or write stories of collective trauma, their narratives were passed down for generations. Collective trauma was then written and ingrained into local culture, sealing separation between Black communities and nature for over a century.

Sinking Ambitions of Conquest

After the Emancipation Proclamation in 1863 and the fall of the Confederacy in 1865, Louisiana saw rapid change that brought on what was believed to be massive infrastructural and economic advancements that would later cause more collective trauma and ended residents' true ability to have autonomy over their land and their communities. Louisiana was exploited for its rich sediment and New Orleans was where the deals for various forms of exploitation were signed. In quick succession, these events took place throughout the twentieth century. Four moments defined Louisiana's relationship with the natural ecology and hydrology of the Delta that remained mostly untouched until the twentieth century. The quick succession of these events provided short term benefits and, as we will discuss, long-term and irreversible negative impacts on the environment, political will, and social upward mobility.

Prior to the emancipation of the enslaved and after, the city and state struggled with drainage. Even with thousands of slaves working around the clock, the problems of proper drainage, sewerage, and sanitation were difficult to manage, especially considering the city's natural topography. Most towns and economic centers in Louisiana were built by the Mississippi River on ancient ridges. Nevertheless, Louisiana still saw consistent flooding because the land was built by the rich sediment from the river and nearby lakes and bayous. At this time, technology and engineer-

ing could not hold back the power of the Mississippi (Davis 2018). Architectural design at the time was pulled directly from French and Spanish architecture and did not adapt to seasonal flooding and subtropical rain and storms. Additionally, drinking water, which came from the Mississippi River, was unsanitary and caused a variety of illnesses because residents could not figure out how to properly sanitize the muddy Mississippi waters. According to Emily Perkins and John Magill of the Historic New Orleans Collection, over 4,000 people died from yellow fever in 1878 caused by the lack of pavement and drainage. In 1880, over 80 percent of the city remained unpaved. A virus, caused by mosquitoes from Africa and Latin America, took effect within six days and caused serious illness and death. It was unclear to residents in the nineteenth century what was causing the massive death in the wet summer months but everyone knew something must be done. The same year that yellow fever killed over 4,000 people in New Orleans, residents also learned that over 20,000 died along the Mississippi River Valley all the way to Memphis from the yellow fever that had started in New Orleans (Perkins and Magill 2020).

As a response to these devasting events, travel and trade to New Orleans was banned and cities along the Mississippi closed their ports to ships coming out of New Orleans. After several failed millage attempts to pay for a new drainage system, residents finally agreed to a new millage in 1899 leading to the development of the Sewerage and Water Board (Perkins and Magill 2020). By 1905, the city finally built its first water sanitation plant and by 1913, the wood screw pump was invented, which catalyzed a new movement and forever changed the landscape of New Orleans and all of Southeast Louisiana. Designed by a local engineer in 1913, the wood screw pump became the leading method to rid the city of standing water and consistent flooding forever, reducing the risk of yellow fever and allowing for the expansion of the Orleans Parish and other coastal parishes. To do this, healthy marshland was drained to make way for development of post–World War II construction. This invention, resulting from location of the knowledge capital in local communities, was the key to the city's cultural, economic, and structural expansion so it could become a major metropolis of the South. As a result, trees, grass, parks, and other characteristics of the natural environment were quickly removed and paved for development (Lux 2018). Fear of another yellow fever outbreak instilled a deep resistance to standing water, and greenspace made way for an unprecedented amount of pavement. Additionally, this work contributed to rapid subsidence in New Orleans and surrounding parishes. Suddenly, the spongy Delta was forcibly dried out, pushing the land downward and making it more prone to flooding. As is often noted, no good deed goes unpunished. In finding a solution to the

spread of disease and other homegrown fixes for the infrastructure, new vulnerabilities were exposed.

Oil Wealth

As New Orleans was grappling with the struggling drainage systems plaguing residents up and down river, the oil boom was revving up. The first oil well discovered in Louisiana was found in Jennings, Louisiana in 1901. The small well produced over 7,000 barrels a day and exploration across North and Central Louisiana commenced (Wells and Wells 2005). While the story of oil in Louisiana is ongoing, the most important detail related to it was that the industry advanced technology, with the marsh buggy and drill barges that allowed for ongoing oil exploration in water and coastal areas. By the 1930s, oil fields in Southeast Louisiana dwarfed fields in northern Louisiana, which were much smaller and, in many cases, already emptied. By the 1970s, most oil drilling was located offshore in the deepest parts of the Gulf of Mexico. Beyond oil drilling and processing being toxic to the environment, the greatest threat to Louisiana was the ongoing destruction of coastal lands. To reach oil in the deep waters of the Gulf of Mexico, developers built canals through freshwater marshes and swamps, leading to irreversible saltwater intrusion (Phillips 2020). Over 10,000 miles of canal were cut into the once healthy marshland, which could stretch halfway around the world. To make matters worse, over 13,000 miles of debris from the development of these canals sat where they were left, causing further damage and killing the wetlands with either too much or too little water.

The big oil boom was great for the economy until the 1980s, and at the height of the boom, oil companies were pumping 360 million barrels a day. Roughly an eighth of what is extracted from Saudi Arabia was being harvested from the small and impoverished state of Louisiana. The toxic brine, a water byproduct with ten times the salinity of the ocean, was dumped into marsh lands and waterways killing any leftover land and polluting rivers and bayous from which residents thrived in their hunt for food (Meehan et al. 2017). What was good for the few oil investors was bad for everyone else in Louisiana and by the time brine was regulated in 1985, the damage was already done. The damage between saltwater intrusion, subsidence and toxic oil and gas brine, is ongoing and Louisiana loses an estimated football field a day of coastal land due to saltwater intrusion and sea level rise. Louisiana is estimated to lose roughly $15 billion per year to ecological and economic development that could otherwise be profitable for a variety of other industries (Burdreau 2018; Mahoney 2021).

The Great Flood

Another watershed moment for Louisiana occurred in the 1920s. It altered the fabric of the nation. One writer for the *New York Times* argued that "once more, war was on between the mighty old dragon that is the Mississippi River and his ancient enemy, man" (quoted in Parrish 2017). Heavy rain and snow from the Ohio River Valley rushed downriver toward the Mississippi River bursting levees, starting in Illinois to Southeast Louisiana, from March to May of 1927. During that time, 27,000 square miles of land were inundated with water breaking all the man-made levee systems and destroying homes and communities. Over 170 counties in seven states were severely impacted. Within that time, an estimated 637,000 to 931,159 people became homeless, with an estimated 555,000 of these individuals being racial and ethnic minorities. In Louisiana alone, over 10,000 square miles across twenty parishes were submerged (Bradshaw 2011). Additionally, New Orleans saw record rainfall of up to fourteen inches in April (1927) during the Great Flood. While the levees did not fail, they were expected to do so within days. The only solution for protecting the city and Baton Rouge from mass destruction was to blast the levees downriver. That would mean flooding an entire area, on purpose, to save the major economic and political areas. Even though communities downriver protested, the governor and the federal government proceeded. Over the next ten days the National Guard blew the levees at Caenarvon Township using 39 tons of explosives on the levees and releasing over 250,000 cubic feet of water per second into neighborhoods and farmland. Over 10,000 people overnight became refugees and were moved temporarily to New Orleans while they waited for the flood waters to recede. Each family was supposed to be compensated, but they grossly underestimated the financial impact. Some families received a total of $274, while most, especially Black families, received nothing to this day. The same could be said west of Louisiana where more rural farmlands were flooded. Nearly 60,000 families were displaced but many saw no compensation or support to help rebuild. To add to the mass tragedy, the refugee camps also perpetuated extreme racial inequality. Supplies and means of evacuation after flooding for both those in Caenarvon and the Atchafalaya River Basin were given strictly to white citizens, with African Americans receiving only those supplies that were left. African Americans also did not receive supplies without providing the name of their white employer or a voucher from a white person. White supremacists saw this as an opportunity to further exploit Black labor. African Americans were frequently forced to work against their will and were not permitted to leave the camps to care for and tend to their land and families. The Red Cross, along with Secretary of

Commerce Herbert Hoover, deliberately concealed the abuses that Black refugees suffered in Red Cross camps in order to obtain donations for the rebuilding effort. Thus continued the oppressive subjugation of diasporic peoples in the industrialized world (Bradshaw 2011; Parrish 2017).

Hurricanes

The sixth historic *marker* to impact Louisiana is its hurricane experience. This climatic history begins with the biggest legacy of the flood of 1927: the creation of the Army Corp of Engineers. In 1928, the Flood Control Act was passed by President Coolidge, creating the first ever flood control system managing the entire length of the Mississippi River and connecting rivers and tributaries. The new federal agency received $325 million to design, engineer, and build levees, spillways, dams, and diversion channels. For nearly seventy-eight years, the levee systems prevented massive flooding events like the flood of 1927 and previous flooding events.

On 9 September 1965, Hurricane Betsy made landfall as a Category 3 storm and challenged man-made engineering. The Mississippi River Gulf Outlet (MRGO), a 76-mile-long navigation channel was built by the Port of New Orleans and the Army Corp of Engineers. Built to be a "shortcut" to the Gulf of Mexico for ships bringing goods in and out of the country, it soon became clear that it was instead a shortcut for storm surge flooding the Lower 9th Ward Neighborhood of New Orleans and St. Bernard Parish. Flooding over 165,000 homes of mainly Black and low-income communities and destroying coastal communities and farmland, Hurricane Betsy became the first flood to top $1 billion in damages (Ouchley 2015). As a response, the Army Corps designed the Hurricane Protection Program to protect the city of New Orleans against Category 5 storms. Unfortunately, on 29 August 2005, the Army Corps levees failed yet again, devasting the entire Southeast Louisiana Region, and parts of Mississippi and Alabama coastal communities.

On 29 August 2005, Hurricane Katrina proved to be more than just a case of failed levees for New Orleans and parts of Southeast Louisiana. It was a collision of failed government on all levels and failed engineering dating back to the nineteenth century. Nearly two centuries had passed and, once more, man-made engineering failed residents. Diasporic and indigenous communities endured the brunt of the pain, stress, and trauma. After Hurricane Betsy, the Army Corp had opted not to close and fill in the MRGO, leaving residents of New Orleans East and the Lower 9th and St. Bernard Parish vulnerable to massive flooding. After the Hurricane Protection Levee System was built, the authorities failed to maintain them year after year, as the slaves and poor were forced to do yearly due to natural

erosion. After a hundred years of practice, New Orleans' leadership still failed to protect the poor, elderly, and disabled residents in at-risk areas. Further, the local government failed to provide residents with food, water, and supplies days after the storm passed. Once more, the state and federal government neglected to provide federal assistance to residents who were again subject to the whims of poor government planning. Residents of Southeast Louisiana did not receive proper assistance for the loss of their lands despite their payment into flood insurance programs and the oversight of FEMA and other federal agencies charged with protecting residents. When the recovery process began, many realized that Hurricane Katrina further exacerbated issues left unnoticed or untouched over past decades.

The levee systems, managed by the Levee Board and maintained by the Army Corps of Engineers, failed in fifty different locations, flooding over 80 percent of the city. Eighteen years and $25 billion later, significant initiatives have been taken, through federal investment, to repair gray infrastructure as part of the recovery process. This was a clear example of adding funds to benefit a failing system, rather than caring for the residents who were most impacted by its failure. This further exacerbated the inequities. The yellow fever outbreak and the installation of the new drainage system that had already left New Orleans without ample greenspace brought further devastation with Hurricane Katrina, which stripped the city of its trees and green space. The failure of the pumps and the failure of the levees led to mass flooding of a large portion of the city. Toxic standing water remained for over six weeks and led to the mass death of native plants, trees, and grass. When the water was drained, the city lost 60 percent of its already sparse tree canopy. The recovery perpetuated these problems because many homeowners did not receive funding to replace trees or plants.

The hurricane further underlined greenspace inequities because wealthier white neighborhoods with disposable income for landscaping improvement saw far less flooding on higher land. Finally, Black homeowners who could not receive recovery dollars or those who chose not to return left their properties untouched, a sight still evidenced by homes with water lines or search and rescue symbols. In 2019, the city estimated that there were thirty thousand blighted homes still peppering the city, with most concentrated in Black neighborhoods. This blight is more than unsightly; it is a breeding ground for invasive species and encourages divestment and crime (Monteverde 2021). Today, these issues have created the perfect storm as climate change has put New Orleans at increased risk for greater pluvial flooding and tropical storms. In 2021, Louisiana saw the highest level of rainfall in recorded history along with several of the

strongest storms ever recorded (Baurick and Parker, 2021; Broach 2022). The pumping system, built over a hundred years ago, was not created for the frequency and intensity of the rain, making the system a financial risk and burden rather than an asset. The lack of trees and green space compounded with subsidence exacerbates the impacts of these storms. Eighteen years since Katrina, New Orleans is still grappling with the loss of green space from over 300 years ago.

In post-Katrina recovery, which many would argue Southeast Louisiana is still engaging in, residents are often perceived to be resilient. Harking back to Judith Rodin's presentation on behalf of the Rockefeller Foundation, she noted that "storms may be inevitable, but crisis is not. Crisis does not have to become disaster and by building resilience, New Orleans and other cities can prepare for the next disruption while building a stronger society and economy at the same time." She further pointed out that "when a misfortune hits, as it did in New Orleans, cities have the opportunity to grow, to transform, and this is the essence of resilience building" (Rodin 2015). It is widely recognized that resilient communities are as aware of their assets as their vulnerabilities. Through coalition building, communities can build capacity and self-regulate to become adaptive and flexible. By locating their assets and integrating their intellectual capital, they can engage in knowledge-sharing to avoid redundancy and advocate for environmental sustainability.

Knowledge Approaches to Sustainable Development

As Louisiana engages strategic recovery planning, recognizing disaster, attributed to Mother Nature, man-made errors, destructive behavioral patterns, myopic elected officials, underfunded government agencies, and inadequately trained engineers, budding architects of recovery planning realize that the gray infrastructure, pivotal to the city's success in the twentieth century, is vulnerable to the vicissitudes of the twenty-first century and the intensification of climate change. As local communities and leadership begin to seek recovery from poor systems, they realize that there were several core problems with how Europeans and Americans tackled the natural infrastructure of Louisiana and, specifically, New Orleans.

First, engineers have tried, over decades, to prevent the Delta from doing what it was meant to do. The Louisiana Delta only exists today because the Mississippi River flooded yearly for thousands of years, pouring rich sediment, sand, and silt over each other, developing a spongy, soft land mass that requires frequent regeneration from the river to replenish itself, lest the land sink. After three hundred years since the founding of New

Orleans, it should be finally realized that humans cannot control how the natural ecology works. Especially considering that gray infrastructure and the built environment, meant to hold the river and other bodies of water back, were only temporary solutions.

Second, Louisiana realized that there must be a better, more practical way to define what "resiliency" means. The people of Louisiana have been called resilient for their ability to bounce back and recover quickly from tragedy, misfortune, or change. But, considering the lack of infrastructure or systems to prevent the repetition of these tragedies, one could question whether Louisiana's residents are indeed resilient or just accommodating. One of the best commentaries on resilience is found in an article entitled "A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities" (Bruneau et al. 2003) where resilience is perceived as "the ability of social units (e.g., organizations, communities) to mitigate hazards, contain the effects of disasters when they occur, and carry out recovery activities in ways that minimize social disruption and mitigate the effects of future earthquakes." To enhance seismic resilience, therefore, is to minimize loss of life, injuries, and other economic losses for the benefit of preserving quality of life. The relevance of this observation to disaster in Louisiana is clear. Responding to hurricanes should share similar objectives of minimizing loss of life, injuries, economic losses, and a reduction to the quality of human life. This recognition, over time, has led to new movements to re-develop Louisiana and engage collaborative energies within new, community-based coalitions for post-disaster recovery. The progress made by these collaborations constitute a significant step toward a true embrace of resilience and efforts aimed at redesigning green infrastructure, redefining urban water management, and envisioning resiliency in terms of achieving a better quality of life.

Third, the last core issue rarely addressed is collective trauma due to ongoing racial and environmental injustice. While the ability for residents of Louisiana to endure numerous tragedies can still be seen as an asset, it can lead to political apathy and distrust. On a political and economic level, it has prompted the federal government to invest less in a community knowing that they can recover without the required tools and resources. Furthermore, it has held the state back, leading to generational poverty, reduced economic opportunities, massive wealth gaps, and deep poverty for Black and indigenous communities still recovering from events prior to the twentieth century. In 2019, Louisiana ranked fiftieth in the union overall, forty-eighth in education, forty-eighth in opportunity, forty-second in fiscal stability, and fiftieth in natural environment ("Overview of Louisiana" 2021). These rankings are rooted in racial inequality and weighted by the history of environmental injustice and climate degradation. All the

above outcomes are deeply ingrained in colonization, and the belief that the land and people, as well as their outputs must be controlled and monopolized for economic opportunity, even if that risks the failure of social and ecological systems. The very idea that the largest river in the United States must be controlled by humans is absurd and has led to natural disasters, furthering man-made error and state sanctioned violence.

Post-Disaster Recovery

Infrastructure

The natural infrastructure movement was launched in 2014 by a small group of kindred spirits. A framework for development was laid out in four dimensions:

1. Robustness: the strength of the system to withstand a given level of stress.
2. Redundancy: the extent to which a system can maintain its functional requirements in the event of disruption.
3. Resourcefulness: the capacity to identify problems, challenges, and mobilize resources as needed to prevent degradation of the system.
4. Rapidity: the ability to mobilize resources in a timely manner to contain losses and reduce further disruption.

The above dimensions are seen as hallmarks of resiliency. Since many would agree that Louisiana is not nearly as resilient as it is anecdotally described, redesigning for resilience begins with an understanding of what is needed to claim successful management of Louisiana's most central issues. A framework for developing the local infrastructure underlies what it would take for Louisiana to ground its recovery and claim its best life. It may be true that while residents display high levels of perseverance, endurance, and tenacity, being unable to overcome high levels of injustice, oppression, and inequity resulting from systematic challenges of inept government on all levels has left Louisiana residents with a tolerance for the status quo. But resiliency requires more than tolerance and the ability to adapt. So, what would it take to achieve true recovery, claim every dimension of resiliency, and transform the infrastructure to meet the challenges of a changing global climate? Identifying new ways of knowing and producing knowledge for a better quality of life is a good starting point for Louisiana communities and collaborative engagement of the knowledge resources available to them.

After centuries of error, a group of professionals, realized that moving forward with the tried methodology would be continuing a broken system, and constitute a waste of taxpayer dollars. Founders of The Water Collaborative of Greater New Orleans understood that New Orleans required a new methodology to combat the bowl effect and the mounting inequities from pre- and post-Katrina. Motivated by meetings with the Dutch and ongoing research, they realized the necessity to un-engineer the engineered and live with water, a core component of this quasi-grassroots movement. In 2006, a year after Hurricane Katrina, the Dutch Embassy invited a delegation of Louisiana residents to learn about how the Dutch live with water. Two sets of meetings took place in 2008 ("Dutch Dialogues" 2014). The root of the water management movement emanated from the Dutch dialogues, which brought multiple disciplines together to solve resiliency and risk mitigation issues. "As opposed to working in silos, the dialogues allow people to work across disciplines to work on problems as the climate changes. Those challenges could be about drought, flood, or water supply issues" ("Dutch Dialogues" 2014).

David Waggoner, regarded by many as the godfather of the "living with water" movement in Louisiana was part of the 2006 Louisiana delegation and developed the Dutch dialogues. He knew that Louisiana's gray infrastructure systems were failing but our values and processes around these systems were also an essential problem, something that had not been discussed beyond a theoretical level. Living with water, is more than an engineering technique; it is a way of life and a cultural shift. Concepts that go beyond problem solving but are deeply rooted in design thinking, systems integration, and interdisciplinary approaches are closely tied to the success of the Dutch. Unlike the Dutch, Louisiana's water systems are rooted in racism and classism, and caused generational traumas brought on by various forms of violence, making the challenges much more difficult to address.

In 2010, David Waggoner received federal funding from the state office of Community Development to turn ideas into designs and plans. Waggoner & Ball and a team of designers developed a comprehensive plan to transform New Orleans, known as the Greater New Orleans Urban Water Plan, which was published in 2014. While they tackled various issues and presented it beautifully and clearly, it could also be considered a book of philosophy because government officials did not buy into the concepts put forth initially (Waggonner & Ball n.d. [2014]). Waggoner and founding members of The Water Collaborative understood that it would take more than a beautiful book, it required action. Thus, The Water Collaborative (TWC) was built by participants in the Dutch dialogues and the Urban Water Plan. This process, from the Delegation to the Urban Water Plan,

took fourteen years to get from concept to action (Waggonner & Ball n.d. [2014]). In 2015, a strategic plan funded by the Kresge Foundation, for The Water Collaborative was finalized. At the core was still the physical as well as cultural shift of "living with water."

For New Orleans, living and thriving with water means making the most of the city's surface-built environment pervious to reduce natural and man-made flooding risk, undo historic racist practices, and create a durable city that could sustain stronger tropical storms, pluvial flooding, and other climate risks such as heatwaves and drought. This vision also includes a city that thrives by addressing climate, racial, and class trauma through the development of green spaces. To achieve this, the core concept was to make New Orleans a sponge city again and return it to its Delta state. Sponge city is exactly as it sounds. Since the Louisiana Delta is made of a mix of water, sand, silt, and other sediment, it makes sense to return the land to its spongy nature. To achieve this, natural infrastructure, or specifically green infrastructure would be implemented to scale. From residential to public and private land, water would need to be sunk, slowed, or stored to better live with it and create true resiliency.

The Infrastructure Movement

Before we go into the details of this movement, it is important to define green infrastructure as well as natural infrastructure. There are several definitions of natural infrastructure but there are two that truly stand out. The first definition by the International Union for Conservation of Nature, the World Bank Group, and the World Resource Institute, represents nature-based solutions as: "Actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (Luedke 2019).

Another definition that speaks to the core ideas of the natural infrastructure movement in Louisiana is the US Army Corp of Engineer's definition. Ironically after almost a hundred years of gray infrastructure development across the United States, the Corps has come to terms with the benefits of natural infrastructure and the shortcomings of gray infrastructure. They define natural infrastructure as engineering with nature or "the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental, and social benefits through collaboration" (Bridges et al. 2021).

Basically, natural infrastructure in its truest form is just building back nature that has been eroded through man-made development, natural erosion or climate change examples of natural infrastructure include liv-

ing shorelines, sand dunes, coral reefs, coastal wetlands, nature reserves, and even urban forests are part of the natural infrastructure movement (Luedke 2019).

Green infrastructure is very similar and falls under the category of natural infrastructure although the difference is that green infrastructure incorporates gray infrastructure systems as part of its design since urban or suburban environments should be connected to other systems such as sewerage and drainage lines and a transportation system. Further, the American Society of Landscape Architects define green infrastructure as: "Humans harnessing nature for use as infrastructural systems. This can be done at a landscape or site-specific scale and includes both natural systems restoration or protection and build projects that emulate nature" (Luedke 2019).

Types of green infrastructure include raingardens, bioswales, retention ponds, green roofs and walls, tree cells, and even rain barrels or cisterns. These ideas remained insular and within design groups in the city. The natural infrastructure movement picked up steam after two major events in Southeast Louisiana. The first event occurred in 2016 and in multiple parishes: Baton Rouge, Ascension, Livingston, and Tangipahoa parishes experienced heavy rainfall and flooding. What was predicted to be a 6–10-inch rain event turned into a 26-inch rain event and flooded the area with three days of nonstop rain. As a result, thirteen people died, 100,000 homes were destroyed with an estimated 8.7 billion in damages (Samuels 2017). The second event took place in 2017 in New Orleans on another unsuspecting day. The forecast for that day expected rain but did not predict the heavy downpour that would inundate the city with 3–5 inches of rainfall in less than an hour and nearly 9.5 inches in five hours, overwhelming the hundred-year-old drainage system (Gabour 2017). On a good day, the pumping stations, which can pump roughly an inch in the first hour and a half and another inch every hour thereafter, could not keep up with the downpour. What was later disclosed was that several of the pumps were not in service, leaving the city helpless to flooding rain. For nearly half a day, the city was sitting in water, ranging from ankle deep to knee deep. Residents even pulled out their canoes and boats to get around town (Gabour 2017).

After that event, elected officials were frantic to find solutions. Options were to upgrade and put more resources into the aging infrastructure systems. Many realized that the gray infrastructure systems were part of the problem. Thus, the need for green infrastructure to manage water became a priority for both elected and business leaders. The timing was perfect for The Water Collaborative, which became incorporated that same year. Other movements also sprang into action. In 2015, the Gentilly Resil-

iency District had won $141.2 million through the US Department of Housing and Urban Development (HUD) for retrofitting Gentilly, a low-lying, residential neighborhood of New Orleans into a fully integrated water resilient community. This would be the first shot at city government putting major dollars into the concept of living with water. Furthermore, many of the companies and nonprofits that participated in the development of the Urban Water Plan had already begun integrating green infrastructure on private projects ("Fiscal Year (FY) 2014 Funds National Disaster Resilience Competition" 2014). The cultural shift discussed in the Dutch dialogues had yet to become integrated in social, cultural, and political systems. It did not take long, though, for the shift to begin. The movement of green infrastructure in collaboration with businesses and nonprofits worked swiftly to retrofit what was once marsh and swampland into a sponge city.

Achievements of the Infrastructure Movement

Some may wonder how a landscape architectural method for managing water would be as successful as Louisiana's became in less than a year. Since the beginning of the settlement of the land in the Mississippi Delta region by Europeans, there has been a focus on redeveloping the natural ecology of Louisiana into something that it was not, causing continual failure of gray infrastructure systems and collective trauma within Black, indigenous, and low-income communities across the state. The benefits of natural and green infrastructure are immense and include the reduction, or mitigation of urban, suburban, and rural flooding, reduction in heat island effects, and a form of reduction carbon strategy through natural carbon sequestration. Green infrastructure also improves overall quality of life through beautification of communities, increased property values, and space for community gatherings and exercise. Finally, improving a community's overall ability to withstand the impacts of climate change such as sea level rise and extreme weather events, marks the success of the collaboration. This plethora of benefits create true resiliency allowing communities to bounce back faster after major events (US EPA 2022). In terms of resiliency, the four dimensions were easily met and helped move a community, such as the Greater New Orleans area, from tenacity and perseverance to resourcefulness and resilience. More so, the shift to green infrastructure allows residents to see the direct benefit of climate change adaptation strategies that are often not available or accessible to the average resident.

Most residents of Southeast Louisiana are dealing with both the impacts of climate change as well as the ongoing impacts of collective trauma. In terms of collective trauma, many residents do not trust the infrastruc-

ture systems because many are feeling the impacts of Hurricane Katrina, Hurricane Betsy, and even the flood of 1927, which still impact thousands across the state. Often gray infrastructure is a top-down approach authorized and managed by government agencies whom local communities will never know. Nor will residents participate in the design developmental stages, creating systems that perpetuate displacement, causing additional stress to residents when these agencies should be providing relief. Gray infrastructure often does not include community voice, thus taking residents' autonomy and self-determination away from them and leaving them helpless when designs are implemented. Natural infrastructure or green infrastructure creates a new pathway for developing systems that are bottom-up and incorporate community participation, perspective, and voice throughout the entire process. For Louisiana, this is a game changer and not only allows residents to create more opportunities for their own self-determination on their own land or property, but they also allow residents to see firsthand the positive impacts of climate mitigation and adaptation strategies. Natural infrastructure strategies, such as rain gardens, French drains, or even the simple rain barrel, provide residents with real world examples of what the future of Louisiana could look like.

From the perspective of economic impact, it creates new jobs and a robust workforce that employs even entry level workers with adequate disposable income. Yet, it does not end with construction jobs, it is also an intersectional discipline where one can come from many different sectors and have a voice on how green infrastructure is implemented, designed, taught, and incorporated in our day-to-day policies. From urban planners, policy writers, educators, horticulturalists, urban forestry, urban farming, to wildlife management and fisheries, all have a place in natural infrastructure (Greater New Orleans Foundation 2021). Members of The Water Collaborative understood that to see large scale change in how the state deals with the impacts of climate change, collective trauma, and environmental injustices, spaces must be found for intersectional design thinking to create sustainable solutions. Green infrastructure offers a unique opportunity to bring people together from various backgrounds, disciplines, ethnicities, gender identities, and classes around a shared goal. At the core of the great infrastructure or natural infrastructure movement is the idea that we are not only changing the physical infrastructure but the social infrastructure as well. The green infrastructure movement is a social change movement that requires the cultural shift of residents as well as elected leadership. To change the way our system works, we must change how we prioritize certain aspects of our ecology and change how we respond to the natural infrastructure and environment on a day-to-day basis. For this change to occur, collaboration must not expel or dismiss any indi-

vidual's vision or values. It also requires flexible and impartial leadership because often perspectives on what resiliency or sustainability means to us personally is rooted in our own personal trauma, behaviors, thought patterns, and socialization. One of the motivational questions we may each ask ourselves is:

> If I work in or adjacent to the non-profit and movement ecosystem, how am I holding on to purpose, especially given the pulls and contradictions of purity (having to prove that we belong in movement spaces), productivity (maintaining constant performance and output at the cost of overwork, replication, and low impact), personality (pursuing relevance and celebrity activism), and perfectionism (expecting to get it right all the time and being afraid to own up to mistakes)? (Lyer 2020)

For those working in the nonprofit or movement ecosystem or building structures or systems toward environmental justice, we are often bogged down with the many contradictions of purity, productivity personality and perfectionism, often rooted in colonialist thought practices. We often do not realize that when we start moving toward larger system change, we are also working from a colonized framework that can often be in direct opposition to the work we are trying to instill in our own communities. Progress can only occur when one includes the many complex voices even when some of those voices are out of sync, especially in relation to economic development, jobs, gentrification, or public health. For this reason, collaborating in diasporic spaces around climate adaptation and mitigation can motivate and inspire those in less developed regions who have encountered similar silencing of their voices and do not have the community capital to create the green infrastructure that Louisiana has succeeded in developing.

Grassroots Coalitions and Environmental Efforts

In addition to the coalition on green infrastructure, several grassroots organizations have formed with the objective of working together to find innovative strategies to curate the change communities require. More than anything, however, people have stepped in and showed up for one another in ways their government never has or perhaps never could, given the ideological divide that consistently creates stalemate in the decision-making processes of the United States. Local mutual aid networks and grassroots organizations, social movements and community coalitions have soldiered on as they traditionally do. Even though some policies that are enacted are those that fail to address the legacy of racism that contributes to disaster in the first place, and politicians have failed to

enact the same equitable protections and relief for communities of color that they do for wealthy, white communities, Black environmentalists in Louisiana are fighting for legislation to protect their communities from racist policies that have proven to worsen their social and environmental burdens. Community building, the decolonization of values and skill sets, coming back to nature and spirituality as a restorative and teachable space, and navigating political, social, and environmental disasters through solidarity are all ways in which Louisiana communities have dealt with the historical trauma induced by Western society, and ways of behaving that demonstrate resilience to it (Abate and Kronk Warner 2013). Smaller organizations have assumed roles to rebuild and replenish their communities where there is need for improved air quality, less soil degradation, gender equity, economic security, and environmental justice.

Parish Coalitions

RISE, in St. James Parish, Louisiana, is a Black, woman-led grassroots and faith-based organization that has protested Formosa Plastics in Cancer Alley. The group has used its faith and love to target elected officials as well as mobilize the community. During an incident of protest action where the community pressured its local officials to suspend the Formosa plastics permit, a leader in the organization referenced the biblical story of Zacchaeus, comparing the movement's officials to Zacchaeus who, though sinful and greedy, was found to be still worthy of love and grace and also capable of coming to terms with the truth and "coming down from the tree" (Soroski 2019). In Louisiana's faith-based communities, women often lead their community in song and prayer. On this occasion, they entreated (in a chant) their officials to "come down from the tree" and see the damage that Formosa was inflicting on their families' lives. Essentially, the community was advocating for local empowerment, inviting their public to be politically efficacious and their local government to be responsive to the needs of the people. Organizers convinced the community that every household had a stake in the fight to suspend Formosa's permit to build a gargantuan facility whose emissions would kill families in the neighborhood for generations to come.

RISE is only one of the local groups that has galvanized community opposition to the lack of government responsiveness to their environmental situation. Their activism has led to the successful defeat of action to construct a $1.25 billion plastics manufacturing plant in 2019 and the group is currently fighting to prevent Formosa Plastics from building a massive multibillion dollar plastics plant in the parish. It is this level of leadership, in identifying local knowledge capital, empowering those whose opinion

leadership can bring the social capital into harmony to advocate for and empower stakeholders to demand public policy aimed at addressing the needs of vulnerable communities that this manuscript upholds. This evidence of democracy-in-action validates Dahl's (1989) argument that continuing responsiveness of a government to the preferences of its people must rely on the government's ability to perceive the preferences of the people. However, governments' perceptive ability requires the efficacy of community activists, who bring to light what needs to be done, what can be done, and how it needs to be done if indeed sustainable development can be achieved and publics can realize a quality life. Partnering with local government institutions, financial and technological agencies, and continuing to produce knowledge beneficial to small communities can jumpstart development to a sustainable scale.

Concerned Citizens of St. John is another such organization. Chemical giant Dupont, now Denka, opened a plant in St. John's Parish, Louisiana in 1969, and it is the only facility in the country that manufactures neoprene. Chloroprene is a main ingredient in neoprene, and its emissions have contributed to five census tracts around the plant having the highest risk of cancer in the country, which is more than 700 times the national average (Hersher 2018). This facility was a former sugarcane plantation. Robert Taylor, eighty years old and founder of the Concerned Citizens of St. John, grew up as a remnant of this plantation system. Dupont moved in a year after he built a home for his family, an investment he thought, at the time, would benefit his family for generations. When industry moved in, no one was prepared. The impacts were devastating, and their lived environment changed drastically. Many succumbed to the devastating impacts of lifelong exposure to chloroprene emissions, and those still alive, battle debilitating diseases (Taylor 2022). When the EPA confirmed there was no place in St. John Parish with safe levels of chloroprene, Taylor, with the help of the Louisiana Environmental Action Network, founded the Concerned Citizens of St. John, a grassroots organization fighting to hold government officials accountable for the pollution and chemical emissions plaguing their Parish (Dermansky 2017).

The fight for self-determination is ongoing but the group continues to pressure the EPA to take emergency measures to curb the facility's emissions. Most recently, the group has sought help from the international human rights commission and filed an international human rights appeal over Denka's pollution in St. John. The last time this commission took substantial action in Louisiana was eleven years ago when it granted a hearing to Mossville, Louisiana, residents who charged that the US government violated their rights by not forcing local chemical plants to stop polluting their community (Baurick and Parker 2021). St. John is designated a

"sacrifice zone." The Concerned Citizens of St. John hope that the United Nations can amplify their plight to the world and make clear that genocide is being perpetuated against the Black people of Cancer Alley, where the 92 percent of the population impacted by the petrochemical industry is Black, in a state where Black people are only 33 percent of the population (Taylor 2022).

As grassroots organizations have coalesced and advocated for rights relentlessly in the last decade, we note that without the sense of empowerment they experience from citizens standing together to demand their right to healthy air and water, public officials may not be willing to collaborate. The community's voice has the united power to make a difference to citizens' health and safety. Only through utilizing that voice both literally and figuratively will communities achieve the goal of self-determination and claim the sustainable future they have earned. Both RISE in St. James and the Concerned Citizens of St. John have a shared stake in their fight for clean air, water, and soil but they are not alone in this fight. Community, environmental, human rights, civil rights, and religious organizations have come together in solidarity to advocate for the health and safety of the river parishes in Cancer Alley (also known as Death Alley).

The Coalition Against Death Alley (CADA) announced a process of "nonviolent protests" to pressure their elected officials and petrochemical gargantuan facilities to stop poisoning their communities. This coalition has been relentless in their criticisms of the governor and other local officials and will continue to be until they protect the citizens they were elected to serve and give river parish communities a chance at "the good life" (Dermansky 2019). This coalition has successfully united communities up and down the Mississippi River: the poor, the disadvantaged, those designated expendable, Black and white, to fight for the good life they deserve. Together, they are the archers in their story, and their arrow hitting their target depends on their ability to set aside their differences (racial, religious, political, etc.), organize themselves, and create a united front to demand and create a livable future for the river parishes (Lee 2019).

Gulf Coast Alliances

The Gulf Coast Center for Law and Policy (GCCLP) is another social action group that demonstrates how much more can be achieved via community collaboration than passive tolerance of government inaction. As knowledge economy strategies suggest, locating knowledge capital at the grassroots level and producing that capital into innovative designs for environmental sustainability is what is needed to break free of the ceaseless wait on government funds and expertise to rebuild a community devas-

tated by disaster. Although Louisiana is located in a developed country and has greater access to a just environment than people in the developing spaces of Latin America and the Caribbean, there is still much vulnerability in disaster-prone areas of the Black diaspora in the United States.

To address their needs, the Gulf South for a Green New Deal (GS4GND), under the umbrella of the GCCLP, has amassed a coalition of over 200 organizations advancing long-existing work in climate, economic, and racial justice across five states in the Gulf South: Louisiana, Texas, Alabama, Mississippi, and Florida. Launched in May 2019, this coalition is rooted in grassroots organizing led by frontline communities most impacted by disaster. They have advanced a uniquely southern vision and approach to the climate crisis and have grounded themselves and their fight in the strengths of their region: a region that plays a pivotal role in the US economy, national defense infrastructure, and the ongoing advancement of social innovation. Liberation work has always been a key part of Gulf South history, and this coalition has been successful in large part to this region's ability to retain such strong connections to culture, family, community, and land. They have leaned on the wisdom of generations of communities who have lived through the devastating impacts of climate change, environmental racism, and extractive industries, because they recognize frontline communities have unique and important perspectives for the attainment of a good life. They honor and center indigenous knowledge and wisdom in their work by healing and reconciling our human relationship to the land while engaging frontline communities in information-sharing, and participatory, collaborative, and intersectional approaches to liberation for all (Lux 2022). After the coalition launched, Colette Pichon-Battles, from the Gulf Coast Center for Law and Policy, facilitated efforts to author a policy platform that centered southern voices in the fight for a Green New Deal (Lux 2019). This living document started the conversation and gave the Gulf South a seat at the table to hold itself accountable to the unique requirements for a sustainable future (Lux 2022).

Along with law, policy, and other environmental coalitions, the Gulf of Mexico Alliance (GOMA), a regional partnership that focuses on enhancing the environmental and economic health of the Gulf via increased collaboration across the five Gulf states, has also been strident in its advocacy for post-disaster recovery and planning ahead for environmental sustainability. GOMA is part of a network of about 150 participating organizations from state and federal agencies, tribal governments, local communities, academia, non-governmental organizations, and industry. This network strives to empower communities, strengthen their resilience, share data, improve management of coastal habitats and wildlife species, and, very importantly, serve underrepresented groups in any way that would ben-

efit their development. The Alliance believes that working together on common issues resulting from the region's disaster experiences is the best way to tap into local capital to find new and innovative solutions as a collective effort.

Since its inception in 2004, GOMA's achievements have been significant. The Alliance has succeeded in enlightening communities on issues leading up to disaster, post-disaster, and in preparation for further disaster. Through collaborative forums, the Alliance has developed and modified tools to address regional issues and enabled strategic partnerships. The organization has also been critical in tracking restoration efforts. It has earned a reputation for fostering relationships that lead to positive change and has given new meaning to collective energy, demonstrating how much more can be accomplished when groups work together than when a single entity attempts to create change. GOMA's efforts have been particularly outstanding for the diversity of its performance. It is seen as a trusted source of scientific, management, and policy information as a result of the wealth of intellectual capital of its partners and how seamlessly that capital can be produced to develop new ideas that take on the challenges of network communities with similar yet different needs for problem solving and solution identification. Empowered by the wisdoms of the 150 partners and more than a thousand members, the priorities of the region remain a focal point. The ocean partnership is inclusive and provides a commanding voice in the advocacy for a range of stakeholders and, in addition, the network provides coordination and leverage both public and private funding to realize common objectives. Facing the same challenges and finding creative ways to address those challenges allows the Alliance to anticipate next steps and prepare for any eventualities that may create distress for the Gulf. Calling themselves a regional ocean partnership means that they successfully tackle coastal and marine issues with equal efficacy and with solid support from local and regional communities. What GOMA has accomplished can be achieved by collaborative action among Caribbean and Latin American states, where equally underserved members of the Black diaspora abound. When collaborators listen to all stakeholders and learn from their feedback to redress negative output, they are actually engaging the essence of the knowledge economy model being advocated in this study.

Creative Community Project

The Walls Project, located in Baton Rouge, Louisiana, is a growing community organization that epitomizes local grassroots activism that fits well within the framework of knowledge economies, conceptualized as

an alternative model for development in emerging societies seeking sustainable measures for growth. The organization's mission is to stimulate Louisiana's economy via creative pathways. This organization envisions performance in three primary areas:

- creativity by way of painting murals in underinvested schools and neighborhoods, which now serve to motivate communities to honor their past and incorporate it into their present to prepare youth for leadership in the future.
- cultivation of knowledge production by educating and inspiring youths to attain jobs in high demand but for which too few from the community are qualified to participate.
- reactivation of communities by remediating blight and making communities safer and healthier.

In further evidence that Louisiana recognizes the path to development is through the empowerment of its human capital, the Walls Project perceives local communities to be the appropriate change-makers and takes on the role of enlightening others and "challenging preconceptions" in order to unite individual members of the community by "celebrating their differences and igniting progress through dialogue and action" (Williams 2021). In an address to a panel on the Innovation Station, organized by the State Department's Global Women's Issues desk and moderated by Aubrey Paris, Helena Williams outlined the mission of the Walls Project as one envisioning a vibrant, creative economy, accessible to all. The project stresses its areas of focus as public art, workforce training, and blight remediation. This, the project promoters understand as having the capacity to overcome poverty while empowering communities to build culture and be inclusive. The project is funded by generous donations from nonprofits and individual contributors but realization of its vision comes entirely from the community as a bottom-up, rather than the usual top-down, venture for investment.

What the project has brought to the community has been aptly matched by the energies the community invests in the project's development. The idea of the project is not limited to the minorities in Louisiana's capital city but has seen expansion in communities such as Dallas, Texas, and could equally be extended to areas of the diaspora in the less developed and mostly diasporic community spaces in the Americas and Caribbean. Walls have traditionally been built to enclose and protect similarities or exclude dissimilarities. The Walls Project in Louisiana has successfully led programs and events that have built alliances and torn down limiting societal walls that discourage safe, healthy living and prosperous lives. Over the last

decade, this project has contributed to economic growth in the area of approximately $3 million, in partnership with nonprofit organizations, government agencies, and empowered communities. Their progress in the area of public art, urban agriculture, and community reactivation stands as a model for the Black diaspora located outside of Global North sites where a similar need for progress in the molding of human capital exists. There is no doubt that with knowledge-sharing across the Black diaspora, we might see the development gap closing and knowledge economies rising to empower future analysts, problem-solvers, and policy-makers. Movement away from the individualism of the developed world to the collective power that must be harnessed in emerging economies, if progress is to be achieved, is the hope of the future for the far-flung Black diaspora, whose urgency to mitigate disaster risks and prepare for a green, carbon-limited, safe, and healthy world cannot be delayed.

Summary

In Louisiana, disaster has presented itself in numerous forms: super storms, flooding, crumbling infrastructure, government negligence, pandemics, unemployment, corporate greed, and extractive industries, just to name a few. Some would say that Louisiana is both vulnerable and resilient to disaster but these disasters are man-made, and they cannot ever be detached from the context of colonialism, which created both the economic conditions for disaster and the social conditions that limit our capacity to achieve the full dimensions of resiliency. Over the last decade, Louisiana's production of local knowledge and its advocacy for and empowerment of community partnerships have resonated throughout the entire Gulf Coast and are preparing the way for a remarkable turnaround in fortunes as its collaborative energies are engaged in the fight against the onslaught of climate change.

The examples included in this chapter illustrate how communities in Louisiana have acted locally, leaning into their traditional voices and teachings to mobilize their communities, while embracing the diverse livelihoods, cultural values, and social networks that contribute to their adaptive capacity to survive and resist disaster. Advancing grassroots policy and practices that center Black and brown people, laborers, farmers, fisher-folk, tribal nations, and frontline communities (see figure 3.1 below) in a just transition away from extractive economies is tantamount to determining the very survival of the state (First Peoples Conservation Council 2022). But how much more must our communities do to secure the kind of sustainable outcomes necessary for survival, and is survival alone

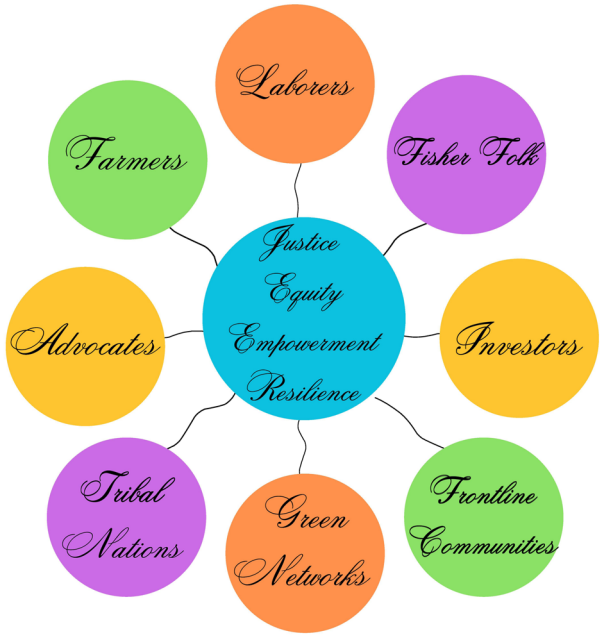

Figure 3.1. Mapping Engaged Louisiana Community. © Pamela Waldron-Moore 2022.

enough? Our traditional knowledge is fundamental to understanding our lived environment, resistance activities, and the resilience and adaptation strategies we adopt that inspire ingenuity. With this we have the ability to solve pressing life challenges and prevent disaster by situating our solutions from within our own deep spatial knowledge. Local indigenous and diasporic knowledge systems and practices are a major resource for striving toward the "good life" and integrating these forms of knowledge with existing practices, increasing our capacity to acquire it. Differences between traditional and Western worldviews mean that incorporating the two can be difficult. Some argue that merging them is not possible, but rather one must recognize that the awareness of each way of knowing can inform new solutions and provide us with the opportunity and capacity to hit our target and live a quality life (Alexander et al. 2011).

How we manage and strive toward our target has much to do with whom it impacts, what their experience is, where it is located, and what resources are available to attain our goals. Are there strong crosswinds? If so, we must aim slightly into the wind. If we aim into the wind, we must aim high to compensate for its slowing effect. Our concept of the "good life" continually changes in our journey to pursue it (Koehn 2012).

Our sense of truly equitable development, as it relates to our own lived environment and ever evolving conditions, also changes throughout our journey to pursue it. It requires that we rebuild with new tools, born of our knowledge capital and produced for our long-term development. Figuring out what makes a human life good has implications for how we treat those whose lives are different from our own. Disasters comes in all shapes and sizes as does their impact on communities and countries of all shapes and sizes. Movements, coalitions, and knowledge-sharing to scale have long been united to create a resilient and sustainable future for all, and our collective fight is anchored in the histories, realities, and power of this region and others like Rwanda and Haiti. It is the only way we can adopt the sustainable development approaches necessary for our survival and attainment of the good life. We must pool our collaborative energies in pursuit of the environmental sustainability our region requires to succeed beyond the level of mere survival. We must deputize ourselves, rather than wait for a government's permission, to produce new knowledge to mitigate the risks of climate change and the attendant disasters that impact our vulnerable communities.

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