



**Food System Resilience Case Study:
New York, NY**

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About Food System Resilience Case Studies

The Food System Resilience Case Studies are a series of working papers developed to highlight food system resilience vulnerabilities and planning in each city. Case studies were written by a project intern in support of ICIC's research. As a working paper, the information provided in this case study represents a preliminary work in progress and may contain errors. Please do not distribute or cite without the contact author's permission.

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Introduction

Increasingly, communities are prioritizing disaster recovery and resilience planning in response to the threat of climate change-related natural disasters. Responding to hurricanes, droughts, intense rain storms, rising sea levels, and more has required municipalities to consider disaster response and resilience planning efforts to ensure continued vitality. A critical component of resilience planning is ensuring that food systems (i.e., the production, processing, and distribution of food) are able to recover from a negative shock and return to normal operations. Several major cities in North America have undertaken significant resilience planning, including food system resilience planning. We identified and studied three cities that either experienced recent natural disasters or have undertaken significant resilience planning to gain a better understanding of how natural disasters have impacted their food systems. Those cities are Toronto, San Francisco, and New York City.

New York City offers an instructive case along both the disaster planning and food system resilience dimensions, having experienced Hurricane Sandy in October 2012. The disaster response and the lessons learned in New York City offer an important look at resilience planning in general, as well as a closer look at food system resilience. The extensive resilience work being done around food systems within the government, non-profits, food businesses and other key organizations also recommends New York City as a case study.

In this case study, we highlight the vulnerabilities that impact the resilience of New York City's food system and identify lessons learned and best practices for risk management. Our analysis was informed by a comprehensive literature review of food system planning initiatives, climate action, resilience and environmental plans, and food system reports or journal articles and interviews with 10 key experts that included city leaders and food system representatives from public and private sectors.

The report is divided into three sections:

- Disaster Overview
- Food System Resilience: Insights from New York City
- Key Takeaways

Disaster Overview

Hurricane Sandy made landfall on October 29, 2012. The storm was downgraded from hurricane status by the time it reached the United States but left behind extensive damage because of its

unusual size and path. Peak storm surge elevations during Sandy ranged between nine and 16 feet in New York City and flooding exceeded 100-year floodplain boundaries by approximately 53 percent.¹ The vast majority of the damage was caused by the storm surge and flooding which killed 43 people and caused \$19 billion in damage.²

According to local experts, loss of electrical service and transportation networks issues were the biggest disruptions. Two million people were affected by power outages, as one-third of all electricity generation was lost. Most service was restored within a week, though customers in the Rockaways in Queens waited an average of two weeks.³ Sixty miles of the City's roads were also severely damaged, most tunnels were closed, and many subway lines were flooded including all lines connecting Brooklyn and Manhattan. New ferry routes, carpool requirements, and bus bridges were all set up in the immediate aftermath, but after two weeks, transportation was by and large back to normal.⁴

The food system was affected by Sandy in various ways. Transportation limitations created barriers to food supply and distribution. Several bridges, including the critical George Washington Bridge, were closed, causing issues with food deliveries. High occupancy vehicles were given travel priority over bridges, which did not include most food delivery trucks. Reduced access to fuel for trucks also limited food shipments within the city.⁵ Flooding challenged the food supply when retailers lost stock due to water damage and lack of power, and residents in the most affected areas lost food at home. Low-income residents were more likely to feel the effects of Sandy on their food supply than others. For example, SNAP recipients were unable to access benefits due to power outages. Since many subway lines were flooded, people who relied on public transportation had more challenges in getting food supplies.

A number of agencies worked together to provide food immediately after Sandy, including the City's Office of Emergency Management (OEM) and the Human Resources Agency (HRA), FEMA, the American Red Cross, the New York Housing Authority, the Food Bank for New York City, food pantries, and the United States Department of Agriculture (USDA). The OEM formed the Multi-Agency Feeding Task Force (MAFTF) with social service providers to share information and move from distributing emergency meals to longer-term support.

Disaster food response went on for several months. The federal government replaced 50 percent of SNAP recipients' October benefits while also honoring reimbursement requests and providing \$6 million in Disaster-SNAP.⁶ Through the USDA, the City was able to provide free lunches to all public school students in November and December and continuing at the most heavily impacted schools through March.⁷ In the hardest-hit neighborhoods, food distribution programs operated through the spring to ensure people access to needed supplies.

Food System Resilience: Insights from New York City

In our analysis, we focused on food availability and food access as the main determinants for food system resilience. Food availability describes the supply of food that is available for purchase or distribution to a city's residents. It includes all points in the food system from food production to consumer access points. Food access describes the ability of a city's residents to purchase food at retail locations or to receive food from institutions. Sandy uncovered many risks within the food system that impacted both food availability and food access, some of which have already been or are in the process of being addressed through current and future resilience planning efforts. The findings that follow were informed by a comprehensive review of secondary sources and interviews with 10 key experts (see Appendix).

Food Availability

Sandy disrupted one of the largest and most complicated food systems in the world. Food arriving from all over the globe is primarily handled by the Hunts Point Distribution Center, a 329-acre facility located in the Hunts Point Peninsula in the Bronx, on the confluence of the Bronx and East rivers. Hunts Point is made up of the Terminal Produce Market, the New Fulton Fish Market, the Cooperative market, and private companies. Food is distributed to approximately 24,000 restaurants, 5,000 grocery and convenience stores, 1,730 wholesalers, 1,000 emergency feeding programs, and 1,000 food manufacturers.⁸ Hunts Point distributes most of the food sold by smaller markets, bodegas, and restaurants that serve low-income populations. Most, but not all, large supermarkets such as Whole Foods, as well as other food wholesalers, have their own distribution centers located outside Hunts Point.⁹

About 12.2 million tons of food arrives from domestic sources each year. Around 46 percent of food arrives into the southern New York region from within the Northeast. This does not indicate where it was produced, only that its trip to the region originated in the Northeast. Smaller amounts originate in the rest of the country, and 29 percent originates internationally.¹⁰ The vast majority of food arrives in New York City via truck. Ninety-five to 97 percent of food products, or almost 6 million tons annually, are trucked into Hunts Point. A total of 13,000 trucks drive in and out of the facility daily.¹¹ As estimated thirty percent of all truck traffic over the George Washington Bridge is carrying food. The remaining small percentage of food volume is transported by rail and ship.¹²

A local food system also has a growing presence in the city, though it still represents a small segment of the total food provided and consumed in New York City. As of 2013, there were 530 registered community gardens covering 70 acres of land throughout the city.¹³ Farmers markets are another strong and developing resource; in 2012, 138 markets were in operation.¹⁴ Farmers

do not currently have a large wholesale distribution option, however. Approximately a dozen farmers were selling their products at Hunts Point as of 2010, although support was limited.¹⁵

Food Availability Vulnerabilities and Risk Management

- **Food production:** The amounts and origins of food arriving in New York City are largely unknown. A lack of clear food supply data makes it more difficult to prevent disruptions in future disaster scenarios, predict future food needs, and understand how food relates to other issues such as public health, economic development, and environmental resilience. To address this problem, the Mayor’s Office of Recovery and Resiliency issued an RFP in May 2014 for a food supply resilience study in an effort to better understand supply chains and their reactions to future disaster scenarios. The Office has commissioned Agriculture and Community Development Services to complete the study.
- **Food distribution and transportation systems**
 - **Location of warehouses:** The location of the Hunts Point Distribution Center presents a number of flooding risks at the three markets. In total, 28 percent of Hunts Point is in the floodplain.¹⁶ The New Fulton Fish Market is vulnerable to storm surge, while the Produce Terminal is at risk for river flooding. While Hunts Point was not compromised during Sandy, many experts noted that a slight shift in the storm's timing would have been catastrophic, causing substantial storm surge flooding. Hunts Point Lifelines, a design project chosen in the Rebuild by Design competition sponsored by the Department of Housing and Urban Development (HUD), will address issues with flood control. The Lifelines plan includes a flood levee and a greenway on the waterfront, which will protect the Hunts Point Distribution Center from future flooding events.
 - **Warehouse energy preparedness:** Experts pointed out that a major risk facing Hunts Point is its dependence on energy systems. For highly perishable food products, a temperature-controlled “cold chain” must be maintained at every point of the food system from production to consumption to prevent spoilage. A resilient energy system is needed in order to maintain the cold chain. The Hunts Point Lifelines project includes plans for an emergency microgrid that will supply electricity to the Hunts Point Distribution Center in the event of a large-scale power outage. The outdated electrical infrastructure at the Produce Terminal will need to be upgraded to accommodate the installation of the emergency microgrid. Newer buildings, such as the New Fulton Fish Market, will not require infrastructural upgrades to be compatible with the microgrid.

- **Transportation modes and pathways:** The roads near Hunts Point are vulnerable to flooding and sea level rise. Since the majority of food distribution is dependent on trucks and roads, flooded transportation infrastructure would disrupt the whole food system even if Hunts Point itself were running. The Lifelines project will build pier improvements that will allow marine food deliveries during emergencies and for fresh seafood deliveries, adding redundancy to the transportation system.
- **Retail outlets:** Sandy proved that small food businesses were at risk of not reopening because of difficulties in disaster recovery. The City changed permitting regulations to allow food businesses to reopen quickly after disasters, passing only a health inspection rather than going through a lengthy re-permitting process. The City created business emergency preparedness guidelines to help small business be more proactive before disasters. Guidelines cover topics such as employee preparation, insurance, and evacuation planning. The City also proposed new state legislation requiring that certain food retailers either install a transfer switch to enable quick connection to a backup generator, or to maintain a backup generator on site. The proposed law requires that backup power be capable of powering retailers' basic systems, but does not require capacity to power refrigeration equipment. The law would apply to stores with 20,000 square feet or more of floor space, or those having 60 or more full or part-time employees.¹⁷
- **Institutions:** Institutions such as schools, hospitals, and prisons provide food for many vulnerable people at any given time. In New York City, such institutions are at risk of flooding. For instance, 20 percent of all hospital beds are in a projected 100-year floodplain for 2050.¹⁸ The City's comprehensive resilience plan, *A Stronger, More Resilient New York*, released by the City's Special Initiative for Recovery and Resilience, recognizes the problem and includes a recommendation to build an integrated flood protection system for several hospitals in Manhattan.
- **Utilities infrastructure:** Electricity disruption was a major challenge during Sandy recovery. Electricity generation facilities, transmission lines, transmission substations, and Con Edison and Long Island Power Authority distribution infrastructure were all affected and could be again in the future. Approximately 50 percent of New York City's electricity generation comes from New York City, with the rest coming from New Jersey and upstate New York. Fifty-three percent of electrical generation is currently in the 100-year floodplain, along with 37 percent of transmission substation capacity and 12 percent of large distribution substation capacity; these are percentages that are expected to rise by 2050.¹⁹ Nearby, New Jersey has set up an Energy Resilience Bank with HUD funds, which provides seed money for a wide variety of resilient energy projects such as microgrids and facilities for low-income communities. New York State has set up a similar initiative called the Green Bank to fund resilient energy projects.

Food Access

Food access in New York City is uneven, and varies with income, race, gender, and neighborhood. Food insecurity—inconsistent access to adequate, appropriate food because of lack of resources—is high, and many households are unsure of where their next meal will come from at some point during the year. Approximately 1.8 million residents receive SNAP benefits, and 75 percent of public school students qualify for free or reduced price lunches.²⁰

The main emergency food distributor is the Food Bank for New York City, which provides food for approximately a thousand food pantries and programs. Its warehouse is located on the Hunts Point Peninsula. The Food Bank for New York City receives some of its supply through donations from Hunts Point vendors and directly from food manufacturers. Many food pantries cite Sandy as a direct or indirect reason for an increase in demand for services. In Staten Island, one of the hardest hit areas of the city, one hundred percent of pantries are feeding more people.²¹

Other entities working to improve food access include the New York City Coalition Against Hunger (NYCCAH), the Mayor’s Office of Food Policy, and City Harvest, a food rescue organization that collects excess food from retail outlets and delivers it to community programs throughout the city.

Food Access Vulnerabilities and Risk Management

- **Population density:** New York City is a large and dense urban area. High density in residential apartment complexes especially causes challenges in food access during disaster recovery, making it difficult for people living on higher floors to get needed supplies during power outages. Ten percent of the current population is in the 100-year flood plain projected for 2050.²² The density and size of the city means that physical flood management systems are necessary to adapt to new climactic conditions, since millions of people cannot be moved out of the way of floods. *A Stronger, More Resilient New York* contains many such examples.
- **Distance to retail outlets:** In New York City, only 9,947 people (0.1 percent) live in a USDA-designated food desert.²³ New York City’s USDA-designated food deserts are all located in Staten Island, although experts noted other non-designated food deserts exist. One report states that three million city residents lack adequate fresh food retail near their homes.²⁴ Experts noted that areas they considered as food deserts (lacking in healthy, fresh food options) were often the same neighborhoods hardest hit by Sandy. Several programs exist to address the lack of fresh, healthy food in low-income areas. They include NYCCAH’s Community Supported Agriculture Program, which allows customers to use SNAP to pick up farm produce in low-

access neighborhoods, and the City's Healthy Bodegas Initiative, which brings fresh produce to small, local retail outlets.²⁵

- **Poverty**

- **Food security:** New York City has high levels of food insecurity—one in six residents, or 1.4 million people, is reported to be food insecure.²⁶ The Mayor's Office of Food Policy leads the City's efforts to develop solutions to food insecurity and has initiated a variety of projects related to food access, security, and sustainability. The Office is able to coordinate between systems related to food during emergency situations, as well as during times of more stability, connecting non-profits, businesses, and government agencies.

- **Nutrition assistance programs:** New York City worked with the federal government to get Disaster SNAP (D-SNAP) benefits in place post-Sandy. Residents often found it hard to take advantage of them, however, since there were only two D-SNAP offices city-wide in downtown Brooklyn and on Staten Island, and the City's HRA did not effectively advertise the benefits. NYCCAH has been working to submit a draft plan to HRA in order to fix the issues, suggesting a community based application process that would be more accessible to residents.

- **Access to subsidized/emergency food:** During natural disasters, multiple pathways of emergency food were needed to provide for everyone in need. One pathway was temporarily disabled when City Harvest's delivery truck fleet was lost to flooding. Although the organization was able to resume operations with a contracted fleet, long-term and pre-planned solutions are necessary to avoid such situations. City Harvest has now created an emergency feeding plan which will be put in place during future disasters.

- **Food prices:** Food prices in New York City rose an average of 52 percent between 2000 and 2014.²⁷ Although the government offers subsidized food benefits to help people afford food, SNAP was recently cut in scope and many people who are eligible have not signed up for them. One of City Harvest's solutions has been to utilize their benefits access department to conduct outreach to connect more eligible residents to SNAP.

- **Public transportation to food:** Low-income residents rely more heavily on public transportation to access food. Solutions proposed by *A Stronger, More Resilient New York* include expanding the Select Bus Service network and developing temporary transportation service plans for times of emergency.

Key Takeaways

1. Both short-term disaster response and long-term recovery planning are happening in New York City. Organizations such as the Office of Emergency Management, and the Human Resources Administration address the former, while the Office of Long-term Planning and Sustainability, the Mayor's Office of Recovery and Resiliency work on the latter. These agencies are uniquely positioned to promote food resiliency within their larger work on overall resiliency. The Regional Planning Agency, serving the larger metro region, is also thinking about natural disaster resiliency.
2. New York City highlights the importance of looking at food system clustering. Experts familiar with distribution note the risk to food distribution if parts are spatially clustered together. The Hunts Point Distribution Center is a physical space in which a large portion of New York City's food passes through, making it more vulnerable than other parts of the food system. Flooding of facilities, electrical system failure, and transportation to and from the center all have the potential to cripple not just Hunts Point, but the entire food system. The City and HUD have realized the distribution system's importance, and are providing the attention and resources necessary to build resiliency.
3. Reacting to immediate food system concerns in the short term is important, but so is projecting and planning for the future of food. Sandy made clear many of the risks the food system faces particularly in low-income, high food-insecure areas. Many experts suggested that food system resiliency depends heavily on the state of the food system before a disaster, particularly accessibility, and that high levels of food insecurity make a food system much less resilient over the long term. Many of New York City's efforts have been focused on immediate recovery from Sandy, but the city is not ignoring the need for longer-term food resiliency initiatives either.
4. New York City has embraced the idea that adaptation to climate change related disasters is essential, not just mitigation. The large numbers of residents and the density development mean that physical adaptations like flood management systems and greenways are necessary to protect infrastructure that already exists, whether that is hospital beds, residential areas, or Hunts Point.

Appendix: Interview Subjects and Contributors

The following list includes the individuals we interviewed in New York City. All interviews were conducted in October and November 2014.

NAME	TITLE	ORGANIZATION
Leslie Gordon	Senior Director of Program Operations	City Harvest
Myra Gordon	Manager	Hunts Point Product Terminal
Kim Kessler	Policy and Special Programs Director of the Resnick Program for Food Law and Policy	University of California, Los Angeles School of Law
Joe Musso	Program Manager – Agency Resiliency	Mayor's Office of Recovery and Resiliency
Richard Roark	Partner	OLIN Studios
Julie Stein	Vice President, Development	New York City Economic Development Corporation
Laura Tolkoff	Senior Planner for Energy and the Environment	Regional Planning Association
Barbara Turk	Director of Food Policy	Office of the Deputy Mayor for Health and Human Services
Jim Wengler	Direct of Benefits Access	New York City Coalition Against Hunger
Joseph Whitney	Logistics Coordinator/Distribution Program Manager	New York City Office of Emergency Management

Endnotes

- ¹ PlaNYC, *A Stronger, More Resilient New York*, (New York, 2013), 13, 42.
- ² PlaNYC, *A Stronger, More Resilient New York*, (New York, 2013), 11-12.
- ³ PlaNYC, *A Stronger, More Resilient New York*, (New York, 2013), 113.
- ⁴ PlaNYC, *A Stronger, More Resilient New York*, (New York, 2013), 177-179.
- ⁵ PlaNYC, *A Stronger, More Resilient New York*, (New York, 2013), 224.
- ⁶ PlaNYC, *A Stronger, More Resilient New York*, (New York, 2013), 225.
- ⁷ Mayor's Office of Food Policy, *New York City Food Policy: 2013 Food Metrics Report* (New York: 2013), 27.
- ⁸ Sarah Brannan, *FoodWorks: A Vision to Improve NYC's Food System*, (New York: The New York City Council, 2010), 3.
- ⁹ Matt Barron, et al., *Understanding New York City's Food Supply*. (New York: Mayor's Office of Long-Term Planning and Sustainability, 2010), 19-20.
- ¹⁰ Matt Barron, et al., *Understanding New York City's Food Supply*. (New York: Mayor's Office of Long-Term Planning and Sustainability, 2010), 14-15.
- ¹¹ PlaNYC, *A Stronger, More Resilient New York*, (New York, 2013), 222-224.
- ¹² Sarah Brannan, *FoodWorks: A Vision to Improve NYC's Food System*, (New York: The New York City Council, 2010), 42.
- ¹³ Mayor's Office of Food Policy, *New York City Food Policy: 2013 Food Metrics Report* (New York, 2013), 4.
- ¹⁴ Office of the State Comptroller, *Farmer's Markets in New York City Report 6-2013* (New York: 2012), 1.
- ¹⁵ Sarah Brannan, *FoodWorks: A Vision to Improve NYC's Food System*, (New York: The New York City Council, 2010), 21.
- ¹⁶ PlaNYC, *A Stronger, More Resilient New York* (New York, 2013), 222.
- ¹⁷ PlaNYC, *A Stronger, More Resilient New York* (New York, 2013), 228.
- ¹⁸ PlaNYC, *A Stronger, More Resilient New York* (New York, 2013), 38.
- ¹⁹ PlaNYC, *A Stronger, More Resilient New York* (New York, 2013), 118-120.
- ²⁰ Mayor's Office of Food Policy, *New York City Food Policy: 2013 Food Metrics Report* (New York, 2013), 24-25.
- ²¹ New York City Coalition Against Hunger, *Superstorm of Hunger*, (New York: 2013), 2-7.
- ²² PlaNYC, *A Stronger, More Resilient New York* (New York, 2013), 31.
- ²³ "Food Access Research Atlas," United States Department of Agriculture, accessed April 13, 2015. <http://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas.aspx>.
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- ²⁵ Thomas Farley and White, V. *New York City Healthy Bodegas Initiative: 2010 Report* (New York: Department of Health & Mental Hygiene, 2010).
- ²⁶ Mayor's Office of Food Policy, *New York City Food Policy: 2013 Food Metrics Report* (New York, 2013), 24-25.
- ²⁷ Diana M. Pearce, *Overlooked and Undercounted* (New York: Women's Center for Education and Career Advancement, 2014), 10.

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