

**Certain Destruction:
Pre-Disaster Mitigation in a Post-Maria World**

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AUTHOR'S FOREWORD

This Note was written in the wake of one of the deadliest hurricane seasons on record with an eye towards disaster preparedness in the face of increasingly frequent natural disasters. At the time of its publication, May 2020, during the height of the COVID-19 global pandemic, this Note's message feels all the more relevant. A natural disaster of a different stripe, pandemics pose a cataclysmic threat that must be addressed in disaster preparedness plans. The conclusions and solutions put forth in this Note can, and must, be applied across the disaster preparedness infrastructure in the United States, from hurricanes to pandemics. It is my hope that by examining past mistakes, as is done in this Note with regards to hurricane preparedness and as must be done by society at large with regards to our preparedness in the face of COVID-19, we can be better adapted to weather the disasters that are sure to come in the future.

I. INTRODUCTION

Three of the five costliest hurricanes in United States history happened during the 2017 hurricane season.¹ Hurricanes Harvey, Irma, and Maria all struck the United States within a one-month period and caused an estimated \$265 billion in damage.² Hundreds of lives were lost³ and the effects of the hurricanes impacted approximately 25.8 million people, nearly 8% of the United States population.⁴ Despite an entire governmental apparatus designed to mitigate risk and provide immediate response in the wake of disaster, many suffered and died due to insufficient mitigation planning and an inadequate response after the hurricanes made landfall.⁵ The aim

1 U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-18-335, 2017 DISASTER CONTRACTING: OBSERVATIONS ON FEDERAL CONTRACTING FOR RESPONSE AND RECOVERY EFFORTS 1 (2018) [hereinafter 2017 DISASTER CONTRACTING].

2 *Id.* at 1, 4.

3 Estimates on the number of lives lost in Hurricane Maria and its aftermath range from 64 to 2,975 people. *See, e.g.*, Nicole Acevedo, *Puerto Rico Lacked Disaster Planning, Communications Strategy, Hurricane Study Found*, NBC (Aug. 29, 2018), <https://www.nbcnews.com/storyline/puerto-rico-crisis/puerto-rico-lacked-disaster-planning-communications-strategy-hurricane-study-found-n904866>; Frances Robles, *Puerto Rican Government Acknowledges Hurricane Death Toll of 1,427*, N.Y. TIMES (Aug. 9, 2018), <https://www.nytimes.com/2018/08/09/us/puerto-rico-death-toll-maria.html>.

4 2017 DISASTER CONTRACTING, *supra* note 1, at 1.

5 Acevedo, *supra* note 3 ("But while most initial headlines focused on the study's number of deaths, the report outlined recommendations based on the

of this Note is to figure out what went wrong and what could be done to prevent it from happening again.

I will not define a single solution to inadequate disaster planning in the United States. Rather, my aim is to highlight the underlying issues that led to the dramatic destruction of property and life in Puerto Rico. I will then provide a brief canvas of possible solutions and their strengths and shortcomings as means to encourage future research that may lead to a practicable solution to the current state of affairs. Ultimately, if the United States does not drastically change its disaster preparedness procedure, some of its most populated regions face certain destruction.

II. THE SCIENCE

Despite consistent warnings from scientists, climate activists, and elected officials that the frequency and intensity of catastrophic weather events would increase with the warming planet,⁶ very little was in place before the 2017 hurricane season to protect and prepare communities for the aftermath of devastating storms, especially in Puerto Rico.⁷

Climate change has been linked to increased and more dramatic instances of natural disasters for over a decade.⁸ In October 2018 the U.S. Global Change Research Program (USGCRP) issued a report stating that the prognosis for climate degradation is worse than originally anticipated.⁹ That report explicitly pointed to

flaws that the hurricane's aftermath exposed, such as a lack of preparation for a massive natural disaster and a series of missteps in keeping the public informed after the hurricane's aftermath.”)

- 6 See, e.g., Richard Black, *A Brief History of Climate Change*, BBC (Sept. 20, 2013), <https://www.bbc.com/news/science-environment-15874560>; Josh Gabbatiss, *Natural Disasters Increasingly Linked to Climate Change, New Report Warns*, INDEPENDENT (Dec. 11, 2017), <https://www.independent.co.uk/environment/climate-change-natural-disasters-link-increase-global-warming-report-warning-a8103556.html>.
- 7 Laura Sullivan & Emma Schwartz, *FEMA Report Acknowledges Failures in Puerto Rico Disaster Response*, NPR (July 13, 2018), <https://www.npr.org/2018/07/13/628861808/fema-report-acknowledges-failures-in-puerto-rico-disaster-response>.
- 8 Chelsea Harvey, *Scientists Can Now Blame Individual Natural Disasters on Climate Change*, SCI. AM. (Jan. 2, 2018), <https://www.scientificamerican.com/article/scientists-can-now-blame-individual-natural-disasters-on-climate-change/>.
- 9 2 U.S. GLOB. CHANGE RESEARCH PROGRAM, IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES: FOURTH NATIONAL CLIMATE ASSESSMENT 36 (2018), https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf [hereinafter USGCRP CLIMATE ASSESSMENT].

increased natural disasters as a direct result of the changing temperatures on Earth.¹⁰ Despite these warnings, the current U.S. Administration continues its efforts to liberalize regulations of natural resource exploitation, allowing for further destruction of preserved land.¹¹

The United States is one of few countries in the developed world that regularly and resoundingly questions the conclusions of scientists, and the value of climate research generally,¹² even if those conclusions are supported by nearly all of the scientific community.¹³ As such, persuading the country's top leadership even to recognize the threat of increased natural disasters is an uphill battle. Despite the difficulty, it is imperative to convince those in power that planning for disasters is essential to the survival of much of the U.S. population, because scientific fact shows that these disasters will keep occurring and getting worse.¹⁴ If elected officials cannot be convinced, the wellbeing of our nation requires that these officials be replaced.

III. THE DANGERS OF MORE NUMEROUS NATURAL DISASTERS

With an increase in natural disasters comes an increased risk for human rights abuses. These abuses frequently manifest as negligent withholding or unequal distribution of vital provisions like fresh water and food immediately after a disaster.¹⁵ Often, commu-

10 *Id.* at 66 (“Individual extreme weather and climate-related events—even those that have not been clearly attributed to climate change by scientific analyses—reveal risks to society and vulnerabilities that mirror those we expect in a warmer world.”).

11 Nadja Popovich et al., *95 Environmental Rules Being Rolled Back Under Trump*, N.Y. TIMES, <https://www.nytimes.com/interactive/2019/climate/trump-environment-rollbacks.html> (last updated Dec. 21, 2019).

12 *See, e.g.*, Cary Funk, *Democrats Far More Supportive than Republicans of Federal Spending for Scientific Research*, PEW RES. CTR. (May 1, 2017), http://www.pewresearch.org/fact-tank/2017/05/01/democrats-far-more-supportive-than-republicans-of-federal-spending-for-scientific-research/?fbclid=IwAR1W1c8D2EPUzwpDytVISqtDwYgdPCsXbg5TzUD0KdczkkWfg3kWU5_UkM.

13 *See, e.g.*, *Scientific Consensus: Earth's Climate is Warming*, NASA, <https://climate.nasa.gov/scientific-consensus/> (last visited Nov. 10, 2018).

14 USGCRP CLIMATE ASSESSMENT, *supra* note 9, at 25.

15 For more information on human rights in the aftermath of natural disasters, see Elizabeth Ferris, *Natural Disasters, Human Rights, and the Role of Human Rights Institutions*, BROOKINGS (Oct. 25, 2008), <https://www.brookings.edu/on-the-record/natural-disasters-human-rights-and-the-role-of-national-human-rights-institutions>; Sue Sturgis, *Recent Disasters Reveal Racial Discrimination in*

nities with the least amount of resources also receive life-saving supplies last or in smaller quantities.¹⁶ Indeed, international legal bodies such as the U.N. Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) have explicitly noted that women and other vulnerable communities, like children and the elderly, disproportionately suffer human rights abuses because of climate change generally and natural disasters specifically.¹⁷ Disaster planning that recognizes the potential for human rights abuses during natural disasters is essential to protect the most vulnerable among us.

Additional threatened human rights include access to safe shelter after a disaster has destroyed residences, access to clean drinking water, and safety from crime. When multiple hurricanes make landfall in the U.S. within a short period of time, all of these dangers, abuses, and needs are amplified. As evidenced by the federal government's response to Hurricane Maria in Puerto Rico, this country has yet to learn from past mistakes made in the aftermath of disaster.¹⁸ Serious efforts must be made to ensure that *all* inhabitants of the U.S. and its territories have access to disaster planning and resources when the next hurricane strikes.

IV. U.S. DISASTER RESPONSE PROCEDURE

The Stafford Act is the principal regulatory apparatus by which disaster response and preparedness is governed at the federal level.¹⁹ It governs the Presidential response to natural and man-made disasters.²⁰ Most powers in this Act are delegated to the Federal Emergency Management Agency (FEMA), which also manages the allocation of federal funds before and after a disaster occurs and provides a general blueprint for managing disaster response efforts.²¹

Before a disaster occurs, the Stafford Act incentivizes local

FEMA Aid Process, FACING SOUTH (Sept. 24, 2018), <https://www.facingsouth.org/2018/09/recent-disasters-reveal-racial-discrimination-fema-aid-process>.

16 Sturgis, *supra* note 15.

17 See generally Office of the High Comm'n on Hum. Rights, Individual Report on the United Nations Convention on the Elimination of All Forms of Discrimination Against Women (Dec. 2013), <https://www.ohchr.org/en/issues/environment/srenvironment/pages/mappingreport.aspx>.

18 Sullivan & Schwartz, *supra* note 7.

19 *About the Agency: Statutory Authority*, FEMA, <https://www.fema.gov/about-agency> (last visited Dec. 10, 2019).

20 *Id.*

21 *Id.*

governments to implement disaster preparedness plans on their own and, using those plans, apply for federal dollars well in advance of any emergency.²² It authorizes the President, through FEMA, to create a program that provides assistance to states and local communities both to create pre-disaster mitigation plans and implement hazard mitigation projects.²³ These hazard mitigation projects must be “designed to reduce injuries, loss of life, and damage and destruction of property, including damage to critical services and facilities under the jurisdiction of the States or local governments.”²⁴ Authorized by this legislation, FEMA has created the Pre-Disaster Mitigation Grant Program through which state governments can apply for assistance by submitting a plan proposal.²⁵ The grant applications range from requests for funds to create disaster preparedness plans to the construction of emergency shelters and the reinforcement of vital infrastructure.²⁶ In this way, the Stafford Act, by creating a mechanism for FEMA to disperse available funds, incentivizes local communities to implement disaster preparedness plans and projects that the community itself has deemed necessary.

One area of particular interest in disaster preparation is advance contracting. Efficient, equitable contracts, created in advance of natural disaster, are necessary to ensure that in the event of a storm, communities already have the means to secure resources like food and shelter, implement search and rescue operations, and begin restoring vital services compromised during the catastrophe. Contracts can be put in place between localities and suppliers ahead of time to be implemented in the event of a disaster. Perishable items, emergency provisions for which a community does not have storage space, and the rebuilding process, which requires a scalable number of skilled workers to come into the community, are all resources

22 42 U.S.C. §§ 5131(c), 5133(b) (2012).

23 *Id.* §§ 5131, 5133.

24 *Id.* § 5133(b).

25 *Pre-Disaster Mitigation Grant Program*, FEMA, <https://www.fema.gov/pre-disaster-mitigation-grant-program> (last visited Jan. 21, 2019). This online resource generally provides extensive, albeit somewhat convoluted, information for state and local governments to use in their pre-mitigation planning processes.

26 *See, e.g., Pre-Disaster Mitigation Program FY 2017 Subapplication Status*, FEMA, <https://www.fema.gov/pre-disaster-mitigation-program-fy-2017-subapplication-status> (last visited Apr. 12, 2019) (providing a list of all grant applications received for fiscal year 2017 and their status in the review process).

that can be contracted for ahead of time. Advance contracting is a preparedness method that has been tested in past disasters.²⁷ Local governments often make contracts with private entities, like construction companies, and these contracts are essential to rebuilding after a natural disaster.²⁸ The federal government, usually through FEMA and the U.S. Army Corps of Engineers (USACE), also establishes advance contracts in an effort to ensure that contracting best practices, like competitive bidding, are in place to protect taxpayers from fraud.²⁹

If contracts are not set up ahead of time in anticipation of future disasters, then communities and local governments must scramble to secure contracts after disaster strikes to restore power grids and access to fresh drinking water, among many other provisions. Without pre-disaster contracts, response efforts are slowed significantly by the lag time in requesting assistance and waiting for those requests to be processed and sent to affected communities.³⁰ Private entities can exploit this desperation by hiking prices and using unfair contractual language.³¹ Corruption on both sides of the bargaining table leads to wasted resources, time, and, sometimes, human life. Transparency in government contracting becomes lost in the chaos. Competitive bidding between companies for contracts, essential to the fair and transparent contract acquisition process, goes to the wayside when those contracts are formed in the wake of a disaster. The entity that most loses out in this scenario is the

27 See, e.g., Kevin J. Wilkinson, *More Effective Federal Procurement Response to Disasters: Maximizing the Extraordinary Flexibilities of IDIQ Contracting*, 59 A.F. L. REV. 231, 233–35 (2007) (“In August 2005, Hurricane Katrina validated the multiple-award IDIQ [indefinite-delivery, indefinite-quantity] contract as an essential contractual vehicle for use during and after natural disasters (and other emergencies), not so much by what was done than by what was not done. Hurricane Katrina exposed serious shortcomings in federal agencies’ logistics and contract planning and execution.”).

28 2017 DISASTER CONTRACTING, *supra* note 1, at 1, 6 (“[C]ontracts awarded by state and local entities in response to the hurricanes, such as debris removal contracts, . . . may be eligible for reimbursement through federal disaster assistance grant programs.”).

29 See *id.* at 85; PROJECT ON GOV’T OVERSIGHT, FEDERAL CONTRACTING 1 (2006), <http://pogoarchives.org/m/cp/cp-KatrinaContracting-08282006.pdf>.

30 *More Efficient Disaster Response Through Pre-Disaster Contracts*, FEMA (July 23, 2019), <https://www.fema.gov/media-library/assets/audio/178862>.

31 See, e.g., Naomi Klein, *How Power Profits from Disaster*, GUARDIAN (July 6, 2017), <https://www.theguardian.com/us-news/2017/jul/06/naomi-klein-how-power-profits-from-disaster> (surveying how private companies profit from disasters both natural and man-made).

taxpayer, who is at the mercy of the government to spend tax dollars in a way that is responsible, efficient, and transparent, so that tax dollars actually go toward protecting the communities that need protection.

Once a disaster has occurred, the Stafford Act requires that the affected state³² request a disaster declaration from the President.³³ The request will be granted, subject to the President's discretion,³⁴ based on a finding "that the disaster is of such severity and magnitude that effective response is beyond the capabilities of the State and the affected local governments and that Federal assistance is necessary."³⁵

Once a major disaster is declared, Governors in the affected region can begin requesting assistance from the federal government through FEMA's Public Assistance and Hazard Mitigation Grant Programs.³⁶ The Public Assistance Grant Program is FEMA's largest grant program and provides assistance to disaster-hit areas for needs like debris removal and emergency protective measures.³⁷ Within

32 The Stafford Act defines the term "state" to include "any State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands." 42 U.S.C. § 5122(4) (2012). As such, any reference to a state in this Note within the context of the Stafford Act should be understood to include Puerto Rico. *Id.*; see also Erin J. Greten & Ernest B. Abbott, *Representing States, Tribes, and Local Governments Before, During, and After a Presidentially Declared Disaster*, 48 URB. LAW. 489, 503 ("States, tribes, and local governments (including public authorities) are eligible to receive direct assistance and financial awards under the Public Assistance Program. A 'state' includes any State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.").

33 42 U.S.C. § 5170 (2012).

34 *Id.* ("Based on the request of a Governor under this section, the President may declare under this chapter that a major disaster or emergency exists." (emphasis added)).

35 *Id.* § 5170(a).

36 FEMA provides a basic overview of this grant program on their website. *Hazard Mitigation Grant Program*, FEMA (Dec. 17, 2019), <https://www.fema.gov/hazard-mitigation-grant-program>. Federal contributions are authorized up to "75 percent of the cost of hazard mitigation programs." 42 U.S.C. § 5170c(a) (2012).

37 *Public Assistance Fact Sheet*, FEMA (Aug. 17, 2018), https://www.fema.gov/media-library-data/1534520705607-3c8e6422a44db5de4885b516b183b7ce/PublicAssistanceFactSheetJune2017_Updated2018.pdf; FEMA, *Public Assistance: Local, State, Tribal and Private Non-Profit* (May 20, 2019), <https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit>.

the Public Assistance Grant program, the Hazard Mitigation Grant Program is specifically for allocating funds for “measures which the President [through FEMA] has determined are cost-effective and which substantially reduce the risk of future damage, hardship, loss, or suffering in any area affected by a major disaster.”³⁸ Requests for local projects are compiled by eligible entities, like state agencies, local governments, etc., and submitted to the state, which then determines which projects are most pressing and eligible for aid.³⁹ Then, the state creates a funding request to be sent to FEMA.⁴⁰ Once FEMA approves a request, funds are released to the affected state’s leadership, which then must distribute the subaward funds to localities as they begin to rebuild and “[m]onitor the activities of the [locality] as necessary to ensure that the subaward is used for authorized purposes; that the activities are in compliance with Federal statutes, regulations, and the terms and conditions of the subaward; and that subaward performance goals are achieved.”⁴¹ FEMA does not provide a specific timeline for how long this process takes, but a FEMA administrator must be involved in the approval process, and often localities need time after the disaster strikes to determine where their greatest needs lie.⁴² Ultimately, despite a robust federal emergency management apparatus, it is up to localities to have location-specific, forward-thinking hazard response plans in place before disaster strikes.

We saw a particularly stark example of the grave consequences of a failure to implement a robust disaster mitigation plan and of the dangers inherent in disaster contracting in the aftermath of Hurricane Maria in Puerto Rico.

V. PUERTO RICO: A CASE STUDY

On September 20th, 2017, Category 4 Hurricane Maria made landfall in Puerto Rico, devastating the island’s already frail electric grid.⁴³ Six days later, the Puerto Rican Electric Power Authority

38 42 U.S.C. § 5170c(a) (2012).

39 FEMA, HAZARD MITIGATION ASSISTANCE GUIDANCE 5, 26 (2015), https://www.fema.gov/media-library-data/1424983165449-38f5dfc69c0bd4ea8a161e8bb7b79553/HMA_Guidance_022715_508.pdf.

40 *Id.*

41 *Id.* at 81–83.

42 *See generally id.* at 78–79, 86.

43 Laura Sullivan, *How Puerto Rico’s Debt Created A Perfect Storm Before the Storm*, NPR (May 2, 2018), <https://www.npr.org/2018/05/02/607032585/how-puerto-ricos-debt-created-a-perfect-storm-before-the-storm>.

(PREPA), a government-controlled entity in charge of electricity for the entire island, entered into a \$300 million no-bid contract with a small, little-known⁴⁴ contractor out of Montana named Whitefish Energy to restore power to the island.⁴⁵ As details of the hastily-drafted contract emerged, multiple government agencies launched inquiries into the questionable circumstances surrounding the formation of the contract as well as the language of the contract itself.⁴⁶ Though Puerto Rico's governor canceled the contract within two months of its formation,⁴⁷ likely as a result of the subsequent media and governmental investigations, this was just one of several questionable contracts that were created in the aftermath of the 2017 hurricane season.⁴⁸

A. Puerto Rico Before the Storm

A comprehensive review of Puerto Rican history is beyond the scope of this Note, but it is worth noting a few aspects of the island's history to paint a clearer picture of the obstacles currently faced by the reconstruction effort there. While Puerto Rico is a U.S. territory and its legal status as such complicates this analysis, many of the difficulties that the island is facing are universal amongst vulnerable coastal communities across the United States.⁴⁹

Native Taíno people populated the island, which they named Boriquéen, for over 1,000 years before Christopher Columbus claimed

44 Indeed, "Whitefish, which received the largest contract yet awarded in the troubled relief effort, had only two full-time employees on the day Hurricane Maria hit the island. The company had never taken on repairs on the scale of the destruction suffered in Puerto Rico." Aaron C. Davis, *FEMA Cites 'Significant Concerns' Over Whitefish Energy Deal in Puerto Rico*, WASH. POST (Oct. 27, 2017), https://www.washingtonpost.com/investigations/congressional-committee-asks-for-records-of-whitefish-energy-deal/2017/10/26/327ba64e-ba9b-11e7-be94-fabb0f1e9ffb_story.html?utm_term=.28a0da1f7d98.

45 *Id.*

46 *Id.*

47 Frances Robles & Deborah Acosta, *Puerto Rico Cancels Whitefish Energy Contract to Rebuild Power Lines*, N.Y. TIMES (Oct. 29, 2017), <https://www.nytimes.com/2017/10/29/us/whitefish-cancel-puerto-rico.html>.

48 Frances Robles, *\$3,700 Generators and \$666 Sinks: FEMA Contractors Charged Steep Markups on Puerto Rico Repairs*, N.Y. TIMES (Nov. 26, 2018), <https://www.nytimes.com/2018/11/26/us/fema-puerto-rico-housing-repairs-maria.html>.

49 See, e.g., John Scala, *U.S. Coastline Vulnerability to Hurricanes is Growing to Unprecedented Levels*, WASH. POST (Aug. 26, 2015), <https://www.washingtonpost.com/news/capital-weather-gang/wp/2015/08/26/u-s-coastline-vulnerability-to-hurricanes-is-growing-to-unprecedented-levels/>.

the land for Spain in 1493.⁵⁰ After smallpox killed most of the native population, Spain brought in human slaves from Africa to exploit the land for sugarcane, tobacco, and coffee.⁵¹ After roughly 400 years of imperial rule, Spain signed Puerto Rico over to the United States under the Treaty of Paris in 1898, formally ending the Spanish-American War.⁵² Puerto Ricans were granted U.S. citizenship in 1917 but were not allowed to elect their own governor until 1948.⁵³ Around this time, the U.S. and Puerto Rican Governments launched Operation Bootstrap, giving tax incentives to big business on the island and increasing the commonwealth's tourism and manufacturing industries.⁵⁴ That operation ended when Congress voted to phase out the tax breaks in the 1990s.⁵⁵ A decade later, Puerto Rico entered a recession that it has yet to escape.⁵⁶

Today, Puerto Rico is home to some 3.4 million United States citizens who do not have representatives that can vote in Congress and who cannot vote in the general election for President of the United States.⁵⁷ The island has declared bankruptcy⁵⁸ and is over \$70 billion in debt.⁵⁹ The island's history as an imperial holding, first by Spain and now by the United States, and the less-than-full citizenship granted to the island's taxed and unrepresented inhabitants cannot be overlooked in an analysis of federally-funded disaster response efforts. The fact that part of Puerto Rico's population is descended from African slaves⁶⁰ and that the median household income in Puerto Rico is drastically below even the poorest state in the union⁶¹ adds elements of race and class into disaster response

50 *Puerto Rico*, HISTORY (Aug. 21, 2018), <https://www.history.com/topics/us-states/puerto-rico-history>.

51 *Id.*

52 *Id.*

53 *Id.*

54 *Id.*; see also Sullivan, *supra* note 43.

55 Sullivan, *supra* note 43.

56 *Id.*

57 *Puerto Rico*, *supra* note 50.

58 *Id.*

59 For a comprehensive overview of the Puerto Rican debt crisis, see Sullivan, *supra* note 43.

60 *Puerto Rico*, *supra* note 50.

61 *Median Household Income (in 2017 Inflation-Adjusted Dollars)*, U.S. CENSUS BUREAU (2017), <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>. The average median household income in the United States was \$57,652 in 2017 whereas the median household income in Puerto Rico was \$19,775. *Id.*

efforts that should be closely scrutinized.⁶²

B. Puerto Rico's Pre-Disaster Mitigation Plan

As previously stated, planning and preparing for disaster is largely the onus of the local government, which is responsible for implementing disaster response plans, creating advance contracts for those specific services that are most likely to be needed in the event of a disaster, and applying to the federal government for pre-emptive funding for planning and mitigation projects. FEMA also provides resources for mitigation and disaster response planning beyond funding, including training at the local level to help implement the National Incident Management System (NIMS), a general framework created to prepare for disasters that can be scaled from the federal level down to the local level and is required by the federal government for local disaster mitigation planning.⁶³ FEMA has regional coordinators to help implement the NIMS framework.⁶⁴

Despite these resources to help enable local disaster mitigation, there is very little by way of oversight and expense tracking at the local level for pre-disaster mitigation.⁶⁵ This general lack of information regarding pre-disaster planning anywhere in the United States does not necessarily prove that the planning does not exist, it simply reveals a substantial flaw in the federal government's efforts to promote pre-disaster mitigation: a lack of oversight.⁶⁶ While Puerto Rico undoubtedly is not the only region deficient in its pre-disaster planning, it has received closer scrutiny in the aftermath of Hurricane Maria, and the reports are rather damning.⁶⁷

62 See, e.g., Connor Maxwell, *America's Sordid Legacy on Race and Disaster Recovery*, CTR. FOR AM. PROGRESS (Apr. 5, 2018), <https://www.americanprogress.org/issues/race/news/2018/04/05/448999/americas-sordid-legacy-race-disaster-recovery/>.

63 *National Incident Management System Training*, FEMA, <https://www.fema.gov/nims-training> (last visited Feb. 16, 2020). For more information on NIMS and how it operates, see Clifford J. Villa, *Law and Lawyers in the Incident Command System*, 36 SEATTLE U.L. REV. 1855, 1861–64 (2013).

64 Texas is located in Region VI. *FEMA Regional NIMS Coordinators*, FEMA, <https://www.fema.gov/fema-regional-nims-contacts> (last visited Feb. 3, 2019).

65 See, e.g., PEW CHARITABLE TRS., NATURAL DISASTER MITIGATION SPENDING NOT COMPREHENSIVELY TRACKED 8 (Sept. 2018), <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/09/natural-disaster-mitigation-spending-not-comprehensively-tracked>; Sullivan & Schwartz, *supra* note 7.

66 See *id.*

67 See, e.g., MILKEN INST. SCH. OF PUB. HEALTH, GEORGE WASH. UNIV.,

According to one report, communication was specifically an issue during and after Hurricane Maria, especially when reporting fatalities.⁶⁸ Neither the Department of Public Safety in Puerto Rico nor the Central Communications Office within the Governor's Office had written emergency communication plans.⁶⁹ Further, "[a]gency emergency plans that were in place were not designed for greater than Category 1 hurricanes . . ."⁷⁰ Despite numerous strategic preparedness activities undertaken at the local level to prepare communities for disaster, when Hurricane Maria hit there was a general lack of communication personnel in place to implement those procedures, effectively negating any pre-disaster mitigation planning that had already occurred.⁷¹ This led to disparities in fatality reports, as well as "contribut[ed] to delayed information availability, gaps in information and the dissemination of inconsistent information to the public."⁷² In this backdrop of chaos, confusion, and lack of communication, the infamous Whitefish contract was formed.

VI. WHITEFISHGATE⁷³ AND IMMEDIATE HURRICANE MARIA RESPONSE

The Whitefish contract in Puerto Rico after Hurricane Maria offers an effective case study on the dangers of negligent post-disaster contracting and the importance of transparency and public involvement in the planning and contracting process.

PREPA is the main local power authority on the island of Puerto Rico.⁷⁴ It is a publicly-held government entity tasked with overseeing the entire power grid on the island.⁷⁵ It is also \$9 billion

ASCERTAINMENT OF THE ESTIMATED EXCESS MORTALITY FROM HURRICANE MARIA IN PUERTO RICO (2018), <https://publichealth.gwu.edu/sites/default/files/downloads/projects/PRstudy/Acertainment%20of%20the%20Estimated%20Excess%20Mortality%20from%20Hurricane%20Maria%20in%20Puerto%20Rico.pdf>.

68 *Id.* at iv.

69 *Id.*

70 *Id.*

71 *Id.*

72 *Id.*

73 I did not coin this term. See, e.g., Jonathan Burman, *The Trump Administration Wants You to Look the Other Way on Whitefishgate*, SIERRA CLUB (Oct. 27, 2017), <https://www.sierraclub.org/press-releases/2017/10/trump-administration-wants-you-look-other-way-whitefishgate>.

74 Javier Balmaceda, *Puerto Rico's PREPA Privatization: A Sale Too Private*, FORBES (Apr. 3, 2018), <https://www.forbes.com/sites/debtwire/2018/04/03/puerto-ricos-prepa-privatization-a-sale-too-private>.

75 *Id.*

in debt and is in the process of privatizing.⁷⁶ Seven of PREPA's eight governing board members are nominated by the Governor of Puerto Rico with only a single publicly-appointed member seat, which presents ample opportunity for conflicts of interest and corruption at the local level.⁷⁷ That structure was changed to include only three governor-appointed members and three independent members elected by Puerto Rico's congress, likely in response to increased scrutiny after Hurricane Maria.⁷⁸ There is one seat on PREPA's governing board that is currently vacant.⁷⁹ It is the one seat on the board for a publicly-appointed member, which the taxpayers elect democratically.⁸⁰ However, an actual election would need to be held to fill the seat, and the Department of Consumer Affairs has, as of 2018, failed to conduct that election.⁸¹ As of this writing, no list of the current members of the governing board of PREPA is available to consumers. Disclosure of the decisionmakers of a public entity in charge of such a fundamental resource as electricity is imperative to ensuring transparency.

Former PREPA CEO Ricardo Ramos inked the deal between PREPA and Whitefish after Hurricane Maria.⁸² Before the Puerto Rico contract, Whitefish Energy was a two-year-old,⁸³ two-man operation out of Whitefish, Montana with experience in small, rural electrical installation projects.⁸⁴ They had no experience on the ground in Puerto Rico or in disaster or emergency situations.⁸⁵ They were not, however, completely unfamiliar with the workings of the federal government. Questions arose when it was discovered that

76 *Id.*; see also P.R. ELEC. POWER AUTH., FISCAL PLAN 19 (2019), [https://aeepr.com/es-pr/Documents/Exhibit-1-FiscalPlan_\(PREPA\)-20180801.pdf](https://aeepr.com/es-pr/Documents/Exhibit-1-FiscalPlan_(PREPA)-20180801.pdf).

77 Balmaceda, *supra* note 74.

78 P.R. ELEC. POWER AUTH., *supra* note 76, at 10, 42; Press Release, Autoridad de Energia Electrica, Senado Confirma los Tres Miembros de la Junta de Gobierno de la AEE (Mar. 25, 2019), <https://aeepr.com/es-pr/Site-Noticias/Paginas/DetallePrensa.aspx?id=12>.

79 Balmaceda, *supra* note 74.

80 *Id.*

81 *Id.*

82 Robles & Acosta, *supra* note 47.

83 Richard Pérez-Peña, *FEMA Cites 'Significant Concerns' with Puerto Rico Power Contract*, N.Y. TIMES (Oct. 27, 2017), <https://www.nytimes.com/2017/10/27/us/whitefish-puerto-rico-electricity.html>.

84 Donna Borak et al., *How Whitefish Landed Puerto Rico's \$300 Million Power Contract*, CNN MONEY (Oct. 29, 2017), <https://money.cnn.com/2017/10/27/news/economy/puerto-rico-whitefish-montana-deal/index.html>.

85 Davis, *supra* note 44.

then-Secretary of the Interior Ryan Zinke, who is from Whitefish, Montana and whose son had worked for the company,⁸⁶ received an email request for assistance from Whitefish Energy after the contract was already signed.⁸⁷ Though Zinke formally stated that he had no ties to the company, the connection with Whitefish put many government agencies on alert for possible corruption.⁸⁸

At a hearing before a House of Representatives committee, PREPA stated that the only reason the utility company entered into a contract with the small, unknown, and inexperienced contractor was because “Whitefish said it would get workers to the island faster, with less money required up front.”⁸⁹ Because the utility company was \$9 billion in debt when the hurricane hit,⁹⁰ it was unable to offer the significant down payments many companies require before beginning work.⁹¹ Whitefish did not request a down payment.⁹² Additionally, the contractor agreed to handle the logistics of finding food and lodging for its workers while on the ground.⁹³ These concessions, which made entering the contract with Whitefish all the more enticing, ultimately enabled the company to include some questionable clauses in the contract itself.

Three aspects of PREPA’s contract with Whitefish sounded alarm bells for government oversight agencies. First, the costs that Whitefish charged PREPA for hourly workers grossly exceeded industry standards and were almost 17 times greater than wages that the workers’ counterparts in Puerto Rico earned.⁹⁴ That these costs were explicitly listed in the contract and were negotiated for, and agreed to, by PREPA suggests either seriously misguided decisions on the part of PREPA’s counsel, severe desperation for relief after the disaster, or corruption at some point in the contracting process. This

86 Robles & Acosta, *supra* note 47.

87 *Id.*

88 *Id.*

89 Alexia Fernández Campbell & Umair Irfan, *Puerto Rico’s Deal with Whitefish Was Shady as Hell, New Reports Show*, Vox (Nov. 15, 2017), <https://www.vox.com/policy-and-politics/2017/11/15/16648924/puerto-rico-whitefish-contract-congress-investigation>.

90 See Balmaceda, *supra* note 74.

91 Robles & Acosta, *supra* note 47.

92 Borak, *supra* note 84.

93 *Id.*

94 Frances Robles, *The Linemen Got \$63 an Hour. The Utility Was Billed \$319 an Hour.*, N.Y. TIMES (Nov. 12, 2017), <https://www.nytimes.com/2017/11/12/us/whitefish-energy-holdings-prepa-hurricane-recovery-corruption-hurricane-recovery-in-puerto-rico.html?search-input-2=the+linemen+got+63>.

raises questions as to the capacity of government entities to contract during these types of emergency situations and further reinforces the need for advance contracts as part of a comprehensive pre-disaster response plan.

The second abnormality in the Whitefish contract is that it contained a no-audit provision. The provision states, “In no event shall PREPA, the Commonwealth of Puerto Rico, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives have the right to audit or review the cost and profit elements of the labor rates specified herein.”⁹⁵ This restricts the ability of the federal government to oversee and review the contract provisions to ensure that taxpayers are not being excessively charged for the services provided by the contractor.

Though this no-audit provision seems to give private contractors alarming leeway in the prices they charge government entities for the services they provide, the provision is not uncommon in government contracts.⁹⁶ Since the 1990’s, federal acquisition reform laws have relaxed regulations on private contracting with government agencies, and powerful lobbying groups have influenced Congress to uphold lax regulations specifically when it comes to “commercial item contracts” that operate similarly to the contract created between PREPA and Whitefish.⁹⁷ The fact that a no-audit provision found its way into this contract illuminates the lack of oversight that the federal government has over FEMA-funded deals and the startling potential for private contracts to exploit that lack of oversight at taxpayers’ expense.

The third questionable provision in the contract states, “PREPA hereby represents and warrants that FEMA has reviewed and approved of this Contract, and confirmed that this Contract is in

95 P.R. ELEC. POWER AUTH., FIRST AMENDMENT TO EMERGENCY MASTER SERVICE AGREEMENT FOR PREPA’S ELECTRIC GRID REPAIRS 27 (2017) [hereinafter WHITEFISH CONTRACT], <https://www.nytimes.com/interactive/2017/11/12/us/document-Whitefish-Contract-Signed-10-17.html>.

96 Scott Amey, *Puerto Rico Electric Contract Concerning, but Normal PROJECT ON GOVERNMENT OVERSIGHT* (Oct. 27, 2017), <http://www.pogo.org/blog/2017/10/puerto-rico-electric-contract-concerning-but-normal.html>.

97 Scott Amey, *Whitefish Exposes Contracts Lacking Oversight Teeth*, PROJECT ON GOV’T OVERSIGHT (Nov. 17, 2017), http://www.pogo.org/blog/2017/11/whitefish-exposes-contracts-lacking-oversight-teeth.html?utm_source=weekly-reader&utm_medium=email&utm_campaign=wr-171118&utm_content=header.

an acceptable form to qualify for funding from FEMA or other U.S. Governmental agencies.”⁹⁸ FEMA officials have since released statements denying it had approved the contract.⁹⁹ This blatantly false provision in the contract indicates unclean hands on both sides.¹⁰⁰

A. *Post-Maria Puerto Rico*

Once the contract between PREPA and Whitefish was made public, authorities began investigating the legality of the contract and how such a contract could come to fruition under the current disaster recovery system.¹⁰¹ Likely in response to the media’s extensive coverage of the deal and Congressional inquiries, FEMA and other governmental agencies began formal investigations.¹⁰² Within two months, PREPA had canceled the contract,¹⁰³ though a provision therein required that Whitefish receive notice 30 days in advance of cancellation.¹⁰⁴ Puerto Rico subsequently entered into other FEMA-funded contracts of an equally questionable nature. One contract, which was later canceled, was for the provision of 30 million meals.¹⁰⁵ Only 50,000 of those meals were ever delivered to the island.¹⁰⁶ These shortcomings indicate that, even when FEMA is involved in the vetting process, the resulting contracts can be devoid of any competitive process and are not necessarily awarded to experienced contractors. As of July 2019, FEMA awarded just over \$6 billion in Public Assistance Grants to Puerto Rico in the wake of Hurricane Maria.¹⁰⁷ Despite this substantial amount of financial assistance, it took nearly a year for power to be fully restored to the

98 WHITEFISH CONTRACT, *supra* note 95, at 30.

99 Pérez-Peña, *supra* note 83.

100 Cf. 12 JOSEPH M. PERILLO, CORBIN ON CONTRACTS § 64.8 (2012) (“[Unclean hands] has been used very broadly to encompass cases where the plaintiff has been guilty of inequitable conduct such as misrepresentation and nondisclosure. The doctrine also applies to conduct bordering on illegality.” (footnotes omitted)).

101 See Davis, *supra* note 44.

102 *Id.*

103 Robles & Acosta, *supra* note 47.

104 Campbell & Irfan, *supra* note 89.

105 Patricia Mazzei & Agustin Armendariz, *FEMA Contract Called for Thirty Million Meals to Puerto Rico. 50,000 Were Delivered.*, N.Y. TIMES (Feb. 6, 2018), <https://www.nytimes.com/2018/02/06/us/fema-contract-puerto-rico.html>.

106 *Id.*

107 *Puerto Rico Hurricane Maria*, FED. EMERGENCY MGMT. AGENCY, <https://www.fema.gov/disaster/4339> (last updated Dec. 6, 2017).

island.¹⁰⁸ Puerto Rico still experiences frequent power outages¹⁰⁹ and certain vital resources, like clinics and hospitals, are still in nearly complete disrepair.¹¹⁰ The 2017 hurricane season was unprecedented and the rebuilding process is long and costly, but as one of the wealthiest countries in the world, the United States must take decisive action to prepare and protect its citizens for this new normal.

VII. IDEAS FOR CHANGE

The disaster response efforts in Puerto Rico and the Whitefish contract created in the immediate aftermath of Hurricane Maria provide a useful case study for examining the shortcomings in the nation's current disaster planning apparatus. To be sure, the potentially devastating lack of pre-disaster planning and effective disaster response is not unique to Puerto Rico, and ineffective planning will cause further loss of life in future disasters across the country. It is essential that we move towards a framework that will better protect people on the ground both during and after natural disaster. As demonstrated above, the current system is grossly inadequate for addressing the reality that disasters will continue to increase in both number and severity, and taxpayers will continue to suffer the double injustice of increased danger and inefficient use of government funds under the current system. I will now provide snapshots of various ideas for improvements to our current system, some more plausible than others. This is an effort to instigate conversations and further research in the hope that one day this destructive cycle can be broken.

A. *Reforming the Stafford Act*

The Stafford Act was originally passed in 1988,¹¹¹ before the threat of more numerous and more destructive natural disasters was the reality. As such, there are a number of shortcomings in the Act

108 Frances Robles, *Puerto Rico Spent 11 Months Turning the Power Back On. They Finally Got to Her.*, N.Y. TIMES (Aug. 14, 2018), <https://www.nytimes.com/2018/08/14/us/puerto-rico-electricity-power.html?module=inline>.

109 See, e.g., *Can Solar Energy Solve Puerto Rico's Energy Crisis?* WNYC STUDIOS: THE TAKEAWAY (Jan. 13, 2020), <https://www.wnycstudios.org/podcasts/takeaway/segments/earthquake-puerto-rico-solar-energy>.

110 Patricia Mazzei, *Hunger and an 'Abandoned' Hospital: Puerto Rico Waits as Washington Bickers*, N.Y. TIMES (Apr. 7, 2019), <https://www.nytimes.com/2019/04/07/us/puerto-rico-trump-vieques.html?>

111 *About the Agency*, FED. EMERGENCY MGMT. AGENCY, <https://www.fema.gov/about-agency> (last updated June 3, 2019).

that need to be modernized. In October 2018, the Disaster Recovery Reform Act of 2018 (the “2018 Reform Act”) became law.¹¹² It amended parts of the Stafford Act and was passed largely in response to the 2017 hurricane season.¹¹³ The 2018 Reform Act resolved some of the most glaring issues with the Stafford Act, but falls short of providing changes that are effective in the long term.

Hurricane Maria hit before the 2018 Reform Act passed, so the recovery efforts there were stymied by the shortcomings of the original Stafford Act. The 2018 Reform Act gave near complete discretion to the executive branch to facilitate the response.¹¹⁴ As originally drafted, the Stafford Act grants the government near total immunity from litigation after disaster response.¹¹⁵ The only possible recourse for individuals who believe they have been harmed by the action (or inaction) of the President or FEMA after a natural disaster is to sue the agency itself for due process or other constitutional claims.¹¹⁶ Mounting constitutional claims against a federal agency is an uphill battle because courts tend to pay a high level of deference to agencies’ discretionary decision making.¹¹⁷ This fact was not addressed in the 2018 Reform Act.

On the heels of the Whitefish contract and perhaps in direct response to one of the contract’s glaring issues, the 2018 Reform Act specifically prohibits the use of “no audit” clauses in contracts by barring the use of federal funds to reimburse “any activities made pursuant to a contract entered into after August 1, 2017, that prohibits the Administrator or the Comptroller General of the United States from auditing or otherwise reviewing all aspects relating to

112 Disaster Recovery Reform Act of 2018 Transforms Field of Emergency Management, FEMA (Oct. 5, 2018), <https://www.fema.gov/news-release/2018/10/05/disaster-recovery-reform-act-2018-transforms-field-emergency-management>.

113 *Id.*

114 *See, e.g.*, 42 U.S.C. § 5174 (2012).

115 42 U.S.C. § 5148 (2012).

116 *See, e.g.*, *McWaters v. FEMA*, 408 F. Supp. 2d 802 (E.D. La. 2006); *Connolly v. Long Island Power Auth.*, 94 N.E.3d 471 (N.Y. 2018). For example, a plaintiff may overcome a defense of governmental immunity by demonstrating that the challenged government actions were proprietary and gave rise to a “special duty” that would support a negligence claim.

117 *Chevron U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 844 (1984). Note, however, that recent decisions have limited *Chevron’s* reach. *United States v. Mead Corp.*, 533 U.S. 218 (2001) (limiting *Chevron* deference to agency decisions that have the force of law).

the contract.”¹¹⁸ This will hopefully incentivize governmental entities to develop contracts that are more transparent and might deter the type of no-bid, haphazard contracting seen in Puerto Rico after Hurricane Maria.

The Stafford Act has a provision specifically promoting the use of local contractors and businesses in the hazard mitigation and rebuilding process.¹¹⁹ This is important for the regrowth of the local economy in a disaster-hit area.¹²⁰ It is also helpful to employ local people to ensure that the needs of the community are being communicated and met, since local businesses likely have a better understanding of the terrain and the various factors that go into rebuilding their own community. Despite this provision, 90% of federal contracts in the rebuilding of Puerto Rico were awarded to companies that are not based or headquartered in Puerto Rico.¹²¹

Clearly the provision is well-intentioned but lacks the teeth necessary to enforce any real local investment. Proof of the provision’s shortcomings is demonstrated by Congress passing a separate Act, the Puerto Rico Small Business Contracting Assistance Act of 2018 (the “PRSBICA”) that specifically incentivizes governmental agencies to award contracts to Puerto Rican businesses over their out-of-state counterparts.¹²² It also gives incentives to contractors who subcontract with Puerto Rican businesses as “Protege Firms” to provide training for disaster recovery.¹²³ This Act would not be necessary if the Stafford Act, as it currently stands, adequately ensured that future disaster contracts go largely to businesses in the affected

118 2018 Reform Act, *supra* note 112, § 1225.

119 42 U.S.C. § 5150(a)(1) (2012) (“[P]reference shall be given, to the extent feasible and practicable, to those organizations, firms, and individuals residing or doing business primarily in the area affected by such major disaster or emergency.”).

120 Nicole Acevedo, *Most Federal Contracts for Puerto Rico Recovery Go to U.S.-Based, Not Local Companies*, NBC (Sept. 26, 2018), <https://www.nbcnews.com/storyline/puerto-rico-crisis/most-federal-contracts-puerto-rico-recovery-go-u-s-based-n913401>.

121 *Id.* This statistic was almost identical in post-Katrina reconstruction efforts (89% of contracts went to out-of-state businesses), signaling a pervasive issue of sending recovery dollars to companies outside of the disaster zone. DEEPAK LAMBA-NIEVES & RAÚL SANTIAGO BARTOLOMEI, CTR. FOR A NEW ECON., *TRANSFORMING THE RECOVERY INTO LOCALLY-LED GROWTH* 11 (2018), http://grupocne.org/wp-content/uploads/2018/09/Federal_Contracts_FINAL_withcover-1.pdf.

122 H.R. 5178, 115th Cong. (2018).

123 *Id.* § 5.

areas. While the Puerto Rico Small Businesses Act may be helpful in promoting small businesses in their post-Maria recovery efforts, nothing in the 2018 Reform Act gave the local business provision the kind of enforcement power necessary for its effective future implementation throughout the country.

An additional shortcoming of the Stafford Act was the provision which required that federal funds only be used to restore infrastructure to its pre-disaster state, even if that infrastructure was already fragile and failing.¹²⁴ It specifically barred the use of federal funds to improve infrastructure beyond the state it was in when the disaster hit,¹²⁵ a severely shortsighted provision meant to save money in the short term. In the 2018 Reform Act, this language was amended,¹²⁶ likely in direct response to the nearly inoperable conditions of the Puerto Rican power grid before Hurricane Maria hit the island. What good would federal dollars do if they went to repair vital infrastructure only to a point of near inoperability? To address this shortcoming, the 2018 Reform Act amended section 404(a) of the Stafford Act (codified as 42 U.S.C. 5170(c)) to require that federal funding allocated for repairs to infrastructure be used to rebuild pursuant to the latest codes and “incorporate the latest hazard-resistant designs . . . in a manner that allows the facility to meet the definition of resilient developed pursuant to this subsection.”¹²⁷

The 2018 Reform Act makes “resiliency” a central tenet of disaster mitigation and rebuilding, ensuring these efforts are made with an eye towards long-term stability in the face of increasing natural disasters. However, despite this forward-thinking change to the Stafford Act, the 2018 Reform Act does not actually define the word “resilience.” It leaves the creation of that definition in the hands of the FEMA administrator, to be communicated within 18 months of the passage of the Act.¹²⁸ FEMA has incorporated this push for

124 42 U.S.C. § 5172(e)(1)(A) (2012) (“[T]he President shall estimate the eligible cost of repairing, restoring, reconstructing, or replacing a public facility or private nonprofit facility . . . on the basis of the design of the facility as the facility existed immediately before the major disaster.”).

125 Campbell & Irfan, *supra* note 89.

126 2018 Reform Act, *supra* note 112, § 1235(b).

127 *Id.* § 1235.

128 *Id.* § 1235(d) (“Not later than 18 months after the date of enactment of this paragraph, the President, acting through the Administrator of the Federal Emergency Management Agency, and in consultation with the heads of relevant Federal departments and agencies, shall issue a final rulemaking that defines the terms ‘resilient’ and ‘resiliency’ for purposes of this subsection.”).

resilience in its 2018–2022 Strategic Plan, listing “[a] prepared and resilient nation” as its vision and building resiliency into its first goal for the coming years.¹²⁹ Clearly, FEMA is aware of at least some of the above-mentioned shortcomings to the current disaster mitigation framework. Whether it is able to sufficiently implement its ambitious resiliency plans will be tested by future disasters.

Despite these recent reforms to the Stafford Act, a number of shortcomings remain, and it is likely that relief efforts after future storms will continue to be costly and ineffective. This makes local disaster mitigation plans, implemented long before a natural disaster occurs, all the more vital to the rebuilding process and long-term infrastructure stability.

B. Strengthening Pre-Disaster Mitigation

There is no shortage of expertise in pre-disaster planning within FEMA and many local communities. At the very least there is extensive information regarding how to apply for and manage pre-disaster grants on FEMA’s website¹³⁰ such that in theory any municipality would be able to access the information and create informed disaster plans. This, of course, requires that communities have the resources to put towards disaster preparedness training, which requires time and personnel with expertise in the area. Additionally, much of the necessary changes for creating communities that can withstand Category 4 hurricanes require extensive rebuilding of infrastructure and a reworking of local codes to encourage disaster-resilient building. This takes time and, most importantly, a lot of money.

1. Pre-disaster mitigation projects require increased funding

Every dollar invested in pre-disaster mitigation saves four dollars in post-disaster rebuilding.¹³¹ The 2017 hurricane season did

129 FEMA, 2018–2022 STRATEGIC PLAN 4, 11 (2018), https://www.fema.gov/media-library-data/1533052524696-b5137201a4614ade5e0129ef01cbf661/strat_plan.pdf [hereinafter 2018–2022 STRATEGIC PLAN].

130 *Grants*, FEMA, <https://www.fema.gov/grants> (last updated Feb. 18, 2020).

131 FEMA, NATURAL HAZARD MITIGATION SAVES (2018), <https://www.fema.gov/media-library/assets/documents/156979>. FEMA’s most recent Strategic Plan, however, states that one dollar in pre-mitigation spending saves up to six dollars in post-disaster rebuilding, so estimates vary. *Id.*; see also 2018–2022 STRATEGIC PLAN, *supra* note 129, at 13.

an estimated \$265 billion in damage in total.¹³² Taking that one-to-four ratio and applying it to the 2017 hurricane season, the communities hit by those storms would have had to invest \$66.25 billion collectively to avoid the damages inflicted.¹³³ This is, of course, an imperfect science and there is no way to calculate exactly how much a community would need to spend to avoid damages. Additionally, it is impossible to plan for and avoid all possible damage that can occur during a hurricane. It is, however, effective in illustrating the larger point: as of February 2019, FEMA provided a total of nearly \$91 billion in Public Assistance Grant Program funds since the creation of the grant program in 1989.¹³⁴ Over its 30-year history, that is an average of about \$2.8 billion per year in disaster funding as compared to the \$265 billion in damage done in one (albeit extraordinary) year alone. What's worse, for FEMA's Pre-Disaster Mitigation Grant Program, for which states can apply ahead of time in order to mitigate against future disasters, a mere \$100 million was appropriated for fiscal year 2017.¹³⁵ This is a laughable sum when compared to the \$66.25 billion communities would have had to invest to avoid the damages caused by the 2017 hurricane season, according to the government's own figures.¹³⁶ The crux of the problem with the United States' pre-disaster planning scheme is not a lack of knowledge or skill, but a dramatic lack of funding.

2. *Emerging technologies can streamline pre-disaster planning*

Localities and the federal government could use tax dollars more wisely by employing emerging technologies to improve communication, data collection, and information dissemination. Having technological systems in place to predict the severity of natural disasters and respond quickly before they hit could save lives and re-

132 2017 DISASTER CONTRACTING, *supra* note 1, at 1.

133 If one dollar in pre-disaster mitigation saves four dollars in post-disaster rebuilding, then arguably \$66.25 billion in pre-disaster mitigation investment would have saved the \$265 billion worth of damage caused by the 2017 hurricane season.

134 FEMA provides an online spreadsheet of all Public Assistance Grants awarded. See *OpenFEMA Dataset*, FEMA, <https://www.fema.gov/openfema-dataset-public-assistance-funded-projects-details-v1> (last updated Feb. 4, 2020) (expand the "Full Data" section; then select one of three links to download the dataset).

135 *Pre-Disaster Mitigation Program FY 2017 Subapplication Status*, *supra* note 26.

136 FEMA, *supra* note 131.

sources.

Localities are already using new technology to respond when disaster strikes. Companies have developed programs that aggregate data about the city infrastructure, location of resources, and location of people (through social media) to determine where the greatest potential loss of life may be and direct emergency services to specific areas.¹³⁷ Drones are used both in the air and under water to determine the extent of the damage and possible dangers before sending emergency rescue crews into the fray.¹³⁸ These technologies help save lives after a disaster occurs. Before disaster strikes, however, governments at all levels should have extensive technological infrastructure in place for rapid response, especially in the face of increased occurrences of natural disasters that can hit in rapid succession.

As discussed above, the federal government established the National Incident Management System (NIMS) as a means for disaster response as early as the 1970s.¹³⁹ With developing technologies, there is no reason why this system cannot be automated into a user-friendly application for computers, phones, and tablets that can be used for communication, information dissemination, data collection, and deployment of resources when disaster strikes.¹⁴⁰ Again, expertise in disaster response is not lacking. Rather, it is the lack of funding and effective disaster response planning and implementation that causes the greatest damage and loss of life during and after disaster. A program that facilitates communication and access to information, including everything from chain of command and procedure to examples of pre-disaster contracts and success stories from other regions, could facilitate both the rapid response and the pre-disaster planning of otherwise isolated localities. A simple grant program specifically dedicated to awarding grants for disaster preparedness technology development could effectively incentivize the creation of these technologies.

The promise of technology for the implementation of disas-

137 Trevor Nace, *How Technology is Advancing Emergency Response and Survival During Natural Disasters*, FORBES (Dec. 15, 2017), <https://www.forbes.com/sites/trevornace/2017/12/15/how-technology-is-advancing-emergency-response-and-survival-during-natural-disasters/#27c18dad9cc8>.

138 *Id.*

139 *See supra* Part V.b.

140 A review of the available technologies indicates that the necessary innovation exists to create comprehensive, accessible disaster response technology. What is lacking is political will and funding. Nace, *supra* note 137.

ter planning and response is tempered by the reality that not all of the United States has reliable internet access, especially after natural disasters.¹⁴¹ Additionally, using the technology would depend upon localities having access to resources like computers, not to mention emerging technologies like disaster-response drones. Along with investment in technology for disaster preparedness, there needs to be a concerted effort to ensure higher resiliency for basic internet access and infrastructure that can withstand various and stronger natural disasters.

C. Taxation

Most natural disasters are geographically localized; therefore, disaster planning and response must be tailored to fit the needs of the affected region. But the nature of the problem is national. The federal government should still fund and incentivize response efforts and, in doing so, collaborate with localities to avoid cookie-cutter solutions.

The federal government is better positioned to fund and implement disaster preparedness because it has greater access to resources. With the 2017 hurricane season as a stark example, the disparity in wealth and resources at the local level has a substantial impact on the destruction and loss of life. The federal government is better positioned to distribute access to disaster preparedness resources across regions to ensure that income level does not determine likelihood of survival during a natural disaster.

Increased and more intense natural disasters will continue to occur across the United States, from wildfires in California to flooding in the Great Plains to hurricanes on the coast. This poses dire threats to U.S. national security, the functioning of interstate commerce, and the resilience of entire swaths of the country. As such, it is the federal government that is not only better positioned to handle, but also highly concerned with, the risks inherent in increased natural disasters. To be sure, localities should still have control and oversight in the implementation of disaster preparation and response, but the federal government is better positioned to fund and provide expertise to those disaster preparations.

One way the government can fund disaster preparation ini-

141 See, e.g., Nick Thieme, *After Hurricane Maria, Puerto Rico's Internet Problems Go from Bad to Worse*, PBS (Oct. 23, 2018), <https://www.pbs.org/wgbh/nova/article/puerto-rico-hurricane-maria-internet/>.

tiatives is through various changes to the tax code. An exhaustive overview of the ways the tax code affects disaster mitigation is beyond the scope of this Note, but it is helpful to consider the possibility that changes to the tax code may be effective in generating the funds necessary to create a comprehensive, realistic pre-disaster mitigation plan. The pros and cons of carbon taxes already have deep scholarship.¹⁴² As stated above, CO₂ emissions have been directly linked to climate change and increased instances of natural disasters.¹⁴³ Science is beginning to link *specific disasters* to increased levels of CO₂.¹⁴⁴ As such, it may be easier in the future to link carbon emissions to hurricanes like Maria. Consequently, it may be easier to hold large CO₂ emitters responsible for the natural disasters directly linked to the emitters' polluting activity. Creating a carbon tax, the revenue of which would go directly to federal programs like FEMA to help communities build resilience before disaster strikes, may be the most viable solution to curbing the dramatic destruction occurring in America's most vulnerable communities.

Two basic forms of carbon tax have become popular proposed policies: (1) a cap and trade model, and (2) placing a price on actual CO₂ emissions.¹⁴⁵ A cap and trade plan gives polluters an allotment of CO₂ emissions and creates a market for those polluters to then sell their unused allotment to other polluters.¹⁴⁶ Comparing the effectiveness of carbon tax versus cap and trade programs is difficult as each is tailored to local needs.¹⁴⁷ There is a general consensus, however, that a carbon tax of some sort is an essential element of a larger climate policy framework.¹⁴⁸ A straightforward carbon tax would place the onus on the largest polluters to aggressively reduce their CO₂ output to avoid the tax. It would also place the responsibility for the pollution squarely on the shoulders of the largest polluters, instead of allowing them to use their capital to purchase more carbon shares and continue polluting.

142 See, e.g., Michael L. Marlow, *The Perils of a Carbon Tax*, REG. MAG., Winter 2018–19, at 28, https://www.cato.org/sites/cato.org/files/serials/files/regulation/2018/12/regulation-v41n4-6_0.pdf.

143 Harvey, *supra* note 8 and accompanying text.

144 See *id.* at 3.

145 Stephen Leahy, *Here's What You Need to Know About Carbon Pricing*, PRI (Sept. 23, 2018), <https://www.pri.org/stories/2018-09-23/heres-what-you-need-know-about-carbon-pricing>.

146 *Id.*

147 *Id.*

148 *Id.*

Another source of tax revenue which should be redirected towards disaster mitigation spending is the Department of Defense budget. The 2019 national security budget proposal sent to Congress in February 2018 requested a total of \$716 billion to fund the National Defense Strategy.¹⁴⁹ That funding must meet a number of different demands, from shipbuilding to space investments to providing for military families,¹⁵⁰ and is essential to the functioning of the United States. Also essential to our national safety and security, however, is funding pre-disaster mitigation projects so that communities can protect themselves from the onslaught of natural disasters threatening our borders. Even the Department of Defense has identified national disasters as a “very real issue” that could pose a major threat to national security.¹⁵¹ Rebuilding and reinforcing infrastructure throughout the United States should be a major focus of Department of Defense spending to ensure that our national security is not compromised by the certain increase in frequency and severity of natural disasters.

D. Insurance

The idea of creating insurance pools to help nations mitigate risk and future expense in the event of catastrophe is not new.¹⁵² The expense of natural disasters is generally borne by local communities and the government. Insurance for natural disasters provides a source of risk transfer while insurance premiums give mitigation incentive.¹⁵³ Unfortunately, the large scale of insuring against natural disasters does not transfer well to traditional forms of private insurance, such as automobile insurance.¹⁵⁴ The intricacies of the catastrophe insurance industry are beyond the scope of this Note, but a case study provides insight into the possibilities and pitfalls

149 *DoD Releases Fiscal Year 2019 Budget Proposal*, U.S. DEP'T. DEF. (Feb. 12, 2018), <https://dod.defense.gov/News/News-Releases/News-Release-View/Article/1438798/dod-releases-fiscal-year-2019-budget-proposal/>.

150 *Id.*

151 *How Natural Disasters Make Major Cities Vulnerable To National Security Threats*, NPR (Sept. 10, 2017), <https://www.npr.org/2017/09/10/549989643/how-natural-disasters-make-major-cities-vulnerable-to-national-security-threats>.

152 *See, e.g.*, Dwight Jaffee & Thomas Russell, *Financing Catastrophe Insurance: A New Proposal*, in *RISKING HOUSE AND HOME: DISASTERS, CITIES, PUBLIC POLICY* 37 (John M. Quigley & Larry A. Rosenthal, eds., 2008).

153 Dwight M. Jaffee, Conference on Catastrophic Risks and Insurance, *Report on the Role of Government in the Coverage of Terrorism Risks* (Nov. 22–23, 2004).

154 *Id.* at 6.

presented by using insurance as a means for mitigating against the risks inherent in climate change.

The Caribbean Catastrophe Risk Insurance Facility (CCRIF) was created after the 2004 hurricane season in response to the intractable vulnerabilities experienced by Caribbean countries, both financially and geographically.¹⁵⁵ The organization is a collective of 19 Caribbean countries and two Central American countries meant to insure against future disasters.¹⁵⁶ It acts as a mutual insurance company controlled by the collaborating governments and allows each country to purchase catastrophe insurance at lower costs than if each individual country saved disaster reserves themselves.¹⁵⁷ In practice, the CCRIF is a pool of capital financed by the countries themselves and donor partners from which countries can purchase insurance plans.¹⁵⁸

The CCRIF was created with the understanding that natural disasters like hurricanes typically only affect a few Caribbean countries per season, if at all. Thus, a collective fund available to all Caribbean countries could, in theory, more easily withstand the financial burden of hurricane seasons than each individual country could on its own.¹⁵⁹ CCRIF also allows for the purchase of microinsurance on the individual level so citizens of member countries can protect their property and land from disaster.¹⁶⁰ The collective also funded a study on the economic impact of insurance and pre-disaster mitigation within the Caribbean.¹⁶¹

The CCRIF offers a promising model for collaboration in the face of increasing risk to help transfer the losses experienced in the wake of natural disasters. A similar model may be viable between localities or states within the U.S.; however, insurance only solves

155 Francis Ghesquiere et al., Caribbean Catastrophe Risk Insurance Facility, World Bank, <http://siteresources.worldbank.org/PROJECTS/Resources/Catastrophicroiskinsurancefacility.pdf> (last visited Mar. 11, 2020).

156 CCRIF *Expands Membership in Central America – Welcomes Panama*, CARIBBEAN CATASTROPHIC RISK FACILITY (Jan. 7, 2019), <https://www.ccrif.org/news/ccrif-expands-membership-central-america-welcomes-panama>.

157 Ghesquiere, *supra* note 155, at 2.

158 *Id.*

159 *Id.*

160 *Climate Risk Adaptation and Insurance in the Caribbean Project*, CARIBBEAN CATASTROPHIC RISK FACILITY, <https://www.ccrif.org/projects/crai/climate-risk-adaptation-insurance> (last visited Mar. 11, 2020).

161 *Economics of Climate Adaptations*, CARIBBEAN CATASTROPHIC RISK FACILITY, <https://www.ccrif.org/projects/eca/eca-economics-climate-adaptation> (last visited Mar. 11, 2020).

one small piece of the larger disaster mitigation puzzle. Insurance payouts after disaster strikes will not mitigate against the loss of life during disaster. It does not solve the cyclical nature of destruction and rebuilding caused by insufficient pre-disaster planning and mitigation. As disasters become more frequent, certain areas of the United States will become less insurable, meaning the risk of insuring a place like coastal Alaska or parts of Florida that are literally sinking beneath the ocean¹⁶² would preclude any insurance availability to begin with, and traditional insurance models would become unfeasible.¹⁶³ Localities should consider establishing an insurance collective like the CCRIF in an effort to spread the cost of risk, especially across locations with disparate socioeconomic levels. Doing so would not solve the problem of pre-disaster mitigation and planning, but it would be a small step towards more equitable disaster resilience.

E. Decentralized Ownership

Clearly, Puerto Rico's current power infrastructure is not sufficiently serving its customers.¹⁶⁴ When something does not work, sometimes the best solution is to replace it. Local residents and sustainable energy organizations have promoted the use of microgrids to create community-owned power facilities.¹⁶⁵ Microgrids are small-scale electric grids, often powered by renewable energy sources like windmills or solar panels.¹⁶⁶ Localized ownership puts the maintenance and operation in the hands of communities which could more effectively manage and distribute the power, creating jobs in the process. The cost of something like a bank of solar panels

162 See, e.g., Amy Martin, *An Alaskan Village is Falling Into the Sea. Washington is Looking the Other Way*, PRI (Oct. 22, 2018), <https://www.pri.org/stories/2018-10-22/alaskan-village-falling-sea-washington-looking-other-way>; Kevin Loria, *Miami is Racing Against Time to Keep Up with Sea-Level Rise*, BUS. INSIDER (Apr. 12, 2018), <https://www.businessinsider.com/iami-floods-sea-level-rise-solutions-2018-4>.

163 *Disaster Risk Insurance: What are the Pros, Cons, and Risks?*, U.N. Development Project (last accessed Mar. 3, 2019), <http://www.sdfinance.undp.org/content/sdfinance/en/home/solutions/disaster-risk-insurance.html#mst-3>.

164 See *supra* Part V.c.

165 Larry Greenemeier & Louis Dzierzak, *As Electricity Returns to Puerto Rico, Its People Want More Power*, SCI. AM. (July 10, 2018), <https://www.scientificamerican.com/article/as-electricity-returns-to-puerto-rico-its-people-want-more-power/>.

166 See, e.g., Allison Lantero, *How Microgrids Work*, U.S. DEP'T ENERGY (June 17, 2014), <https://www.energy.gov/articles/how-microgrids-work>.

may be prohibitively expensive for individuals in Puerto Rico where the average annual income is \$20,000, so the government would likely need to establish a way for localities to secure financing to purchase microgrids.¹⁶⁷ Puerto Rico took a first step in this direction when it legalized the use of microgrids, opening a path for individual communities to generate their own power and no longer depend on the island's ailing electrical infrastructure.¹⁶⁸ The updates to the Stafford Act, discussed above, would also allow the use of FEMA funding to rebuild using new, renewable sources of energy at a local level.¹⁶⁹

Efforts to bring solar microgrids to Puerto Rico have thus far been largely unsuccessful.¹⁷⁰ Tesla endeavored to bring power to the entire island using renewable energy, but the solar panels it has installed have repeatedly fallen into disrepair due to a lack of on-the-ground training and proper maintenance.¹⁷¹ The failure of the project to deliver lasting improvements highlights the pitfalls of depending on private industry to create the infrastructure needed to sustainably rebuild after disaster. Private and non-profit initiatives to bring microgrids into local communities often lack funding to create local jobs to maintain microgrids in the long term.¹⁷² Unless strategic planning is in place to ensure the long-term health of infrastructure, the creation of locally run microgrids will result in little actual benefit to communities.

Microgrids are one more small piece of the larger disaster mitigation puzzle, but if properly implemented they could be a viable solution to the costly rebuilding efforts that will give more autonomy to communities in their own resilience efforts.

VIII. CONCLUSION

The foregoing analysis reveals that there is no single solution to the issue of pre-disaster mitigation. Stronger laws must be drafted to incentivize the creation of local disaster mitigation plans and transparent contracting before and during disaster. Extensive

167 Greenemeier, *supra* note 165.

168 *Id.*

169 *See supra* Part VI.a.

170 *See, e.g.*, Alexander C. Kaufman, *On Puerto Rico's 'Forgotten Island,' Tesla's Busted Solar Panels Tell a Cautionary Tale*, HUFFINGTON POST (May 11, 2019), https://www.huffpost.com/entry/elon-musk-tesla-puerto-rico-renewable-energy_n_5ca51e99e4b082d775dfec35.

171 *Id.*

172 *Id.*

funding is needed to build up the infrastructure and disaster mitigation plans that will create long-term resiliency in the face of a changing climate. Taxes could be used to fund this effort. Collective insurance programs may help to alleviate the risks associated with increased instances of natural disasters. Local buy-in in the form of microgrids and small-scale utility ownership may be viable solutions to the larger infrastructure problems plaguing many communities in the United States and could put the power quite literally back in the hands of communities most affected by climate change. The most glaring common thread through all these solutions, and the problem at large, is a lack of funding which prohibits any comprehensive efforts to break the current cycle of disaster and rebuilding. Ultimately, if nothing is done to change the status quo, we leave our country and its most disenfranchised populations vulnerable to certain destruction.